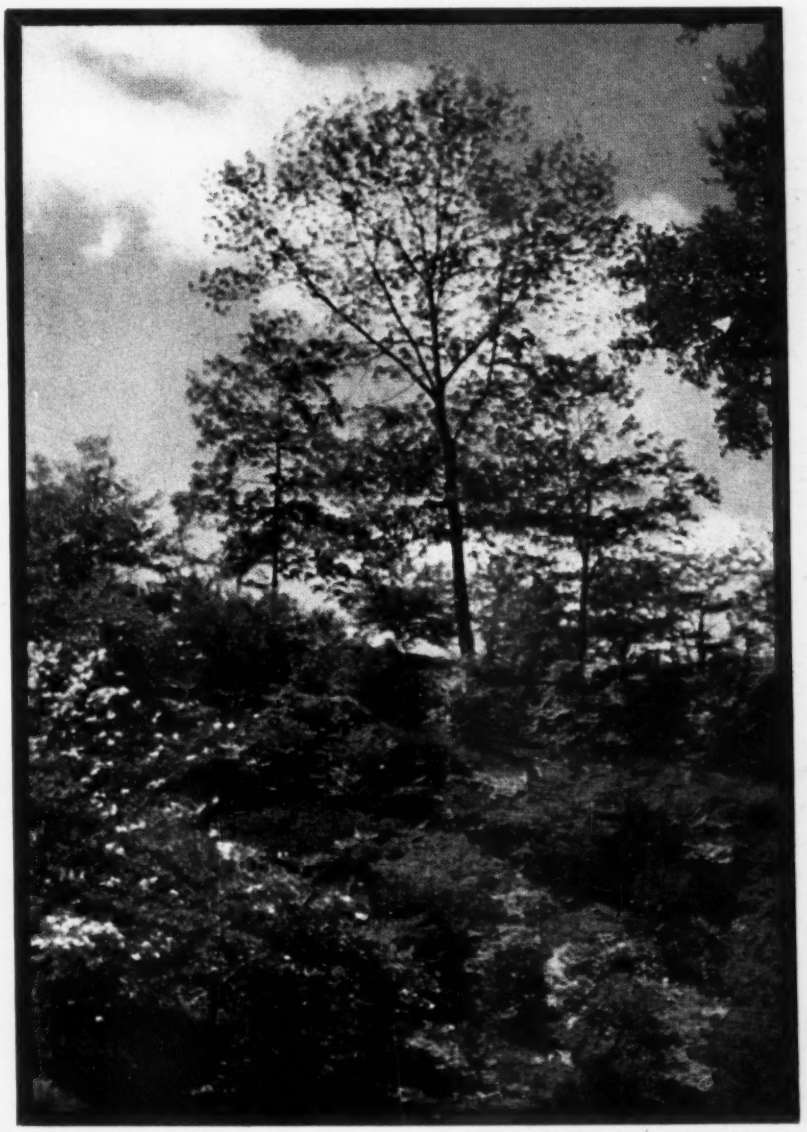
The Garden Journal

of The New York Botanical Garden



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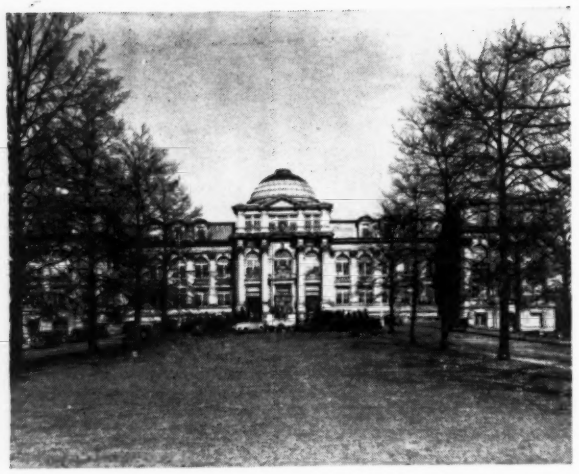

May 11 - November 15. Exhibition, "Cotton from Fables to Fashion." Museum Building.

June 11. Eleventh Annual Rose Day at The New York Botanical Garden. Inspection of Rose Garden, 9:45-11:45 a.m. Afternoon program, 1-4 p.m., Lecture Hall, Museum Building.

DOROTHY EBEL HANSELL
Editor

THE GARDEN JOURNAL
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CREDIT FOR ILLUSTRATIONS

Front cover, colored illustration of azalea planting on hillside at The New York Botanical Garden by David Seabrooks; pp. 71, 72, All-America Rose Selection; p. 73, E. N. Mitchell; pp. 74, 75, the author; p. 76, upper right, M. & H. Clarke, lower left, lower right, Dr. Walter C. Blasdale, center bottom, Al Monner — all courtesy American Primrose Society; p. 77, Gottscho-Schleisner; p. 78, American Primrose Society; p. 79, The New York Botanical Garden; pp. 84, 85, E. N. Mitchell; p. 86, U.S.D.A., Beltsville, Md.; p. 87, U. S. Plant Introduction Garden, Coconut Grove, Fla.; p. 89, the author; pp. 91, 92, the author; p. 96, E. N. Mitchell; p. 97, upper, Bobbink & Atkins, lower, E. N. Mitchell.

AMONG OUR CONTRIBUTORS

JAMES ALEXANDER GAMBLE has served the rose devotedly for more than a quarter of a century. He was first secretary, then chairman of the Rosarium Committee of the American Rose Society; is founder of the popular Potomac Rose Show in Washington, D. C., and trustee of the American Rose Foundation. Mr. Gamble has contributed to many editions of the AMERICAN ROSE ANNUAL and other publications and is author of ROSES UNLIMITED . . . W. RAY HASTINGS was born into the horticultural world, the eldest son of a seedsman-nurseryman of Atlanta, Ga. After being graduated from the University of Georgia and serving as an officer in World War I, he was associated with the H. G. Hastings Co., of Atlanta for twenty-two years. Then he joined the J. Horace McFarland Co. in Harrisburg and All-America Selections. This nation-wide testing of vegetables and flower seeds was initiated by Mr. Hastings in 1932, when he was president of Southern Seedsmen's Association; in 1938, growers and introducers asked for similar tests on roses. Both All-America Seed Selections and All-America Rose Selections, of which Mr. Hastings is executive secretary, are non-profit horticultural institutions. . . . KENNETH D. SMITH is a practising attorney specializing in Surrogate's Court matters. He gave up his earlier hobby of pictorial photography—he exhibited in photographic salons all over the world and received many awards and medals — for horticulture and has been hybridizing daffodils, daylilies and iris. He has received many gold and silver medals, including the hybridizer's medal of the American Iris Society in 1947. Mr. Smith is past director of the American Iris Society and originator of its Symposium. . . . Several decades have passed since young CHARLES CRAWFORD collected plants in the woods and planted them on the grounds of his Pennsylvania home. His Scotch-Irish parents encouraged his hobby and pointed with pride to "Charlie's sweet birch and sassafras." When his school days were over, he gained experience in horticulture in European and American nurseries. During World War I, Charles Crawford served as an expert in camouflage with the U. S. Army. Since then he has been superintendent of a private estate, landscape contractor, and nurseryman. His first love is the primrose, but he also specializes in rare plants and in raising select strains. One hundred testers, representing twenty-six states, report to Mr. Crawford, who compiles the data and then sends his report to the Chief Horticulturist of the Men's Garden Club of America. . . . CLARE W. REGAN was "born in St. Louis, Mo., just seventy-one years ago today, Jan. 22, 1953. As a very small child I was entranced by the fragrance of wild violets, by the mystery of the red sap in the blood-root, and by the beauty of the dogwood." When she was eight, her parents moved to "a silver mining camp, a rip-roaring town of that era," in Montana. She had to find her own amusements, so much of her time was spent in trampling over the hills looking for wild flowers, in climbing rocks and trees. "College, school teaching, marriage, then when our sons were old enough, we camped in our beautiful mountains and collected rare species at altitudes of 8,000 to 11,000 feet. It was fortunate that rock gardening reared its head at that time . . . " . . . FIRMAN E. BEAR majored in agricultural chemistry at Ohio State University and was a member of its teaching staff for several years. After receiving the degree of Ph.D. from the University of Wisconsin and serving as Chairman of Soils Dept., of University of West Virginia, he returned to his native state to become Chairman of Soils Dept. of Ohio State University. Dr. Bear has been director of agricultural research of American Cyanamid Co., science editor for "Country Home Magazine," and is now chairman of Soils Dept. of Rutgers University and editor of "Soil Science." A large part of his time during the past ten years has been devoted to the study of trace elements and more work is being done in this field in the Soils Dept. at Rutgers than in any other soils department in the United States. . . . CLEMENT G. BOWERS, who was a member of the staff of The New York Botanical Garden in the late

(Continued on page 98)

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Climbing Sports of Hybrid Tea Roses

By **James Alexander Gamble**

No garden flowers exceed the climbing sports of hybrid teas in providing color, fragrance, and beauty.

Climbing hybrid teas are important in warmer areas of the United States and more use could be made of them. They form excellent screens and allow a more versatile placement of color and fragrance in gardens.

In areas where climbing hybrid teas are well adapted, the abundance of bloom in the early flowering period greatly exceeds that of the bush varieties from which the climbers sported. However, some climbing hybrid teas fail to bloom as continuously throughout the season as their dwarf counterparts. The growth factors within the plant tend to encourage the production of canes and other vegetative growth at the expense of bloom.

Sports or Mutations

The word "sport" is the popular term for the type of variation known scientifically as a "mutation." In roses, a sport or mutation is a sudden or spontaneous variation that may appear on one plant or a part of a plant. It is caused by a change in the genes or chromosomes in the meristematic tissues that give rise to the part of the plant exhibiting the variation in external characteristics. A dwarf bush rose may suddenly send out a long climbing cane; this, of course, is the origin of the most of our climbing hybrid teas.

Frequency of Climbing Sports

It has been estimated that the expected frequency with which sports appear varies from one in five thousand to one in one hundred thousand plants grown. Hybrid teas are said to sport more frequently than others. This has been attributed to the fact that they are more complex in their genetical make-up than most other classes of roses. In general, color sports appear more frequently than climbing variants. Not all hybrid tea varieties have produced climbing forms.

Some two hundred varieties of climbing sports of hybrid teas are recorded in Modern Roses III and in the American Rose Annuals of 1948, 1949, and 1950.

In connection with recorded climbers it must be borne in mind, however, that during the years since each dwarf has been introduced some unrecorded climbing sports may have appeared. Certainly it would seem that such outstanding varieties as "Mme. Cochet-Cochet," "Good News," "Soeur Thérèse," "Grande Duchess Charlotte," and others have now been produced in sufficient numbers to come within the estimates given for the chance of their climbing sports to appear.

The fact that over seventy percent of the dwarf varieties concerned produced climbing sports within the first eleven years after introduction supports the belief among rose hybridizers that hybrid tea varieties usually sport climbers during their first years. This is both good and bad news for the home gardeners of America. Bad, in that as this study discloses, nearly half of the recorded climbing tea varieties have already disappeared from commerce, although some may still persist in gardens. Undoubtedly, many of them have been forever lost. Many of the cherished bush varieties in our gardens are already old as roses go, too old for us to expect again climbing sports from them. The fact that hybrid tea roses usually sport during their early years is, on the other hand, good news for the home gardeners in that as better roses are produced, we may expect soon thereafter to have climbing sports of them.

Of the thirty dwarf forms with the highest rating mentioned in the 1946 survey of the American Rose Society and reported in the 1948 Annual, twenty-one have sported climbing forms. "Crimson Glory," "Christopher Stone," "Picture," and "Comtesse Vandal" are just a few varieties that have produced fine climbing sports, from four to eleven years after the dwarf forms were introduced. Of these twenty-one climbing sports, eight trace their ancestry to "Ophelia," seven to "Liberty," and eight to "Souvenir de Claudius Pernet."

The nearly one hundred climbing sports of hybrid teas, unimproved by lack of bud selection, and still in commerce, have persisted without much encouragement.

Reversion in Climbing Sports of Hybrid Teas

Webster defines reversion in plants as "the return to an earlier form." In the production of climbing hybrid tea roses in this country, shoot buds cut from climbing canes are usually inserted on Multiflora, Ragged Robin, or Shafter understocks. Each of these stocks is itself a climber, so reversion cannot be due to the understock. It should be borne in mind, however, that these are not usually closely related to the climbing hybrid tea varieties from which the inserted buds are obtained. The reversion of the climbing hybrid tea to the dwarf form may be due to

the bud not having been formed from the tissue derived from the mutation.

There appears to be a dearth of information concerning the variety percentage of reversion of inserted climbing hybrid tea buds in the fields of growers. Reports from a few indicate that variety reversion percentages depend upon the strain of the variety used and is reported to run from ninety percent and over to none at all. For example, the varieties said to revert to their dwarf form in over fifty percent of buds inserted include climbing sports of "Duchess of Atholl," "Hinrich Gaede," "Kaiserin Auguste Viktoria," and "Louise Catherine Breslau." Those showing a reversion of from twenty-five to fifty percent include "Climbing Etoile de Hollande," "E. G. Hill," "Shot Silk," "Picture," and "Talisman." Varieties with less reversion than twenty-five percent include "Climbing Autumn," "Dainty Bess," "Golden Dawn," "Duquesa de Penaranda," "Mrs. Herbert Stevens," "Mme. Henri Guillot," and "Christopher Stone." Those credited by these growers with little or no reversion to dwarf types include "Climbing Mrs. Sam McGredy," "President Herbert Hoover," "Texas Centennial," "Crimson Glory," "Mrs. Pierre S. du Pont," and "Peace."

Reversion in gardens or failure of plants purchased as climbers to exhibit the climbing habit of growth appears to result in part from:

1. Failure to supply the new plant with the care necessary to permit the expression of the climbing tendency shown in the nursery row.
2. Lessening of the vitality of the purchased plant by premature harvesting.
3. Severe cutting back of the canes at harvest or at planting time.
4. The unsuitability of the garden soil.
5. Unfavorable climate.

The Lost Varieties and Contributing Reasons

Many fine climbing hybrid teas have been lost here in America, including the climbing sports of "Antoine Rivoire," "Mme. Caroline Testout," "Ophelia," "Liberty," "Chateau de Clos Vougeot," "Charles P. Kilham," "Mme. Abel Chatenay," "Premier," "Rapture," "Rev. F. Page-Roberts," and "Lady Mary Fitzwilliam." Some one hundred of the climbing hybrid tea varieties recorded in Modern Roses III are no longer in existence.

In general, the climbing hybrid tea varieties grown at any time by nurserymen appear to include those whose dwarf forms are salable. This makes it possible to dispose easily of any plants that fail to show the climbing characteristic.

Undoubtedly, many climbing sports of greenhouse varieties have appeared but have failed to be recognized and propagated. Furthermore, some of these sports may have been lost through the severe cutting back practised after each crop.

Period of Persistence

Seven of the ninety-three climbing hybrid tea varieties listed in catalogues have been in commerce for forty or more years. At least five of these seven are closely related. The records show that "Climbing Kaiserin Auguste Viktoria" and "Climbing Mrs. W. J. Grant," sports of the corresponding bush varieties, which in turn were both seedlings of "Lady Mary Fitzwilliam," are thus related. The latter was produced by Bennett in 1882. Both climbing "Killarney" and "Climbing Lady Ashtown" trace their ancestry to "Mrs. W. J. Grant." The third of these long-persisting climbing sports, "Meteor," was also produced by Bennett five years after he originated "Lady Mary Fitzwilliam." The bush form of "Kaiserin Auguste Viktoria" was produced by Peter Lambert of Germany, and "Mrs. W. J. Grant," "Killarney," and "Lady Ashtown" were originated by Alexander Dickson & Sons of Ireland.

To summarize the apparent advantages and the limitations of this type of rose: Their seeming greatest handicap can result from the winter-killing of their long climbing canes. When this occurs, it usually takes an entire growing season to replace these before maximum bloom may again be expected.

Limitations

1. For the above reason, climbing sports of hybrid tea roses are not suited to all areas of this country.
2. Being largely unimproved, one cannot yet be sure of getting truly representative plants of the climbing varieties he favors.
3. Many of these climbing but unimproved plants tend to produce growth at the expense of bloom.
4. Maximum bloom in the home gardens of America is frequently prevented by failure to provide the full cultural care needed to support fully the growth and bloom urge of the climbing forms that have from twenty to fifty times the canes, foliage, and roses found on their dwarf parents. Too many home gardeners do not supply even the much smaller dwarf parent plants with sufficient water. Their climbing forms, with their extended stem and leaf surface, cannot possibly do their best without copious watering, adequate fertilizing, and the care necessary to sustain their maximum urge to grow and bloom.

Varieties of climbing hybrid tea sports that have grown and bloomed well at Yew Tree Lodge in southern Maryland:

Reds

Scarlet — "Christopher Stone"; Velvet crimson — "Crimson Glory"; Bright red — "Etiole de Hollande"; Unfading scarlet — "Poinsettia"; Brick-red — "Texas Centennial."

Pink

Soft rose-pink — "Dainty Bess"; Glowing pink — "Editor McFarland"; Chatenay-pink — "Lady Sylvia"; Clear blush-pink — "Mme. Butterfly"; Carmine pink — "Lady Ashtown"; Clear rose-pink — "Picture."

Yellow

Sunflower-yellow — "Golden Dawn"; Unshaded yellow — "Golden Charm"; Buttercup-yellow — "McGredy's Yellow"; Canary-yellow — "Mrs. Erskine Pembroke Thom"; Golden-yellow — "Roslyn"; Cadmium-yellow — "Soeur Thérèse"; Golden-yellow — "Mrs. Pierre S. du Pont."

White

Clear white — "Caledonia"; Cream-white — "Kaiserin Auguste Viktoria"; Greenish-white — "Mme. Jules Bouche."

Bicolor

Rose-pink and crimson — "Carrie Jacobs Bond"; Pink and salmon — "Comtesse Vandal"; Orange-coral-red — "Mme. Henri Guillot"; Yellow and copper — "Mme. Joseph Perraud"; Scarlet-copper-orange — "Mrs. Sam McGredy"; Orange shades — "President Herbert Hoover"; Yellow-copper — "Talisman."

Literature lists many other varieties of climbing hybrid tea sports that are reported to grow and bloom well throughout the entire growing season, i.e., California and elsewhere in this country and in Europe. The sources from which plants of the available varieties of climbing hybrid tea sports may be obtained, can be had from the American Rose Society, 1315 Derry St., Harrisburg, Pennsylvania.

ALL-AMERICA ROSE TEST GARDENS

By **W. Ray Hastings**

All-America Rose Selections planting at Iowa State College, Ames, Iowa

New rose varieties from around the world are welcomed for open competition and possible recommendation, according to their behavior in the All-America Rose Selections outdoor test gardens. The term "All-America," rather than All-American, refers to performance and desirability in all sections and climatic zones of the United States of America. Selections need not be American in origin.

Introducers are asked not to enter any variety, unless they believe it has a good chance for recommendation. There is considerable work in running the trials, along with scoring and noting the entries regularly through the growing seasons, so entrants are urged to screen their own entries severely, sending only their very best prospects for trials. Otherwise, judges would be needlessly overburdened.

As it is, there are around fifty new entries each year, four plants of each entry to each test garden, and the trials are run for two years. This makes about four hundred plants to grow, note, and score throughout each season by each judge.

Twenty-two A.A.R.S. judges, with as many test gardens, determine the scores and observations according to behavior of the entries in their gardens and under their climatic conditions only. After the testing period is completed, the judges' final scores or evaluations are averaged for each entry, and a complete tabulation shows the score of each judge on each entry. Judges' comments are briefed as well, at least on all the leading scorers which might have any possible chance of selection.

There are twenty-nine trustees of A.A.R.S. who meet and consider the evaluations for any recommendations. The highest average scored entry is considered first. If it happens to be a hybrid tea rose, the highest scoring entry in the next highest scoring class, such as floribundas and polyanthas, is considered next. Then the highest scoring climber or pillar rose, for example. Then the second highest scoring hybrid-tea rose would be considered, the second highest floribunda, second highest climber. The third highest round would then be considered, and so on until it is evident that no other entry has a chance for selection.

The top-scoring entry is considered by studying the scores of each judge, representing growing conditions in all sections of America. As each judge's score is noted, his comments on the variety behavior are considered. These remarks may cover personal likes and dislikes, whether it holds an attractive color in all stages, how disease-resistant it may or may not be, number of blooms per plant and maybe for each month, whether visitors are attracted by it, whether tender or extra hardy, if there are any weak necks, whether produced singly or size of clusters, whether it has any novelty value and comparisons with other varieties. The trustees probably have seen the entries in at least several of the test gardens and frequently add their own remarks to the briefing.

When every trustee is ready to vote, a secret ballot is taken on that top entry. If two-thirds of the votes are favorable, the entry automatically becomes an All-America Rose Selection as soon as a reasonable quantity of plants may be grown for cooperative introduction. This is expected to take two years. At least a quarter-million plants are wanted for first-year sales.

After the top-scoring variety is voted upon, similar consideration is given and ballots taken on the next high scorers.

All-America rose testing started in 1939. There have been thirty-seven selections to 1953, and there will be two more for 1954. One year, 1951, there were no selections, as none of the entries was believed good enough to rate as All-America. There have been as many as five in a year; now there is a rule providing for a maximum of five in any one year. The average is between two and three.

In A.A.R.S. testing, there has been a desire for a balanced judgment. For practical production and sales purposes, some of the test gardens and their judges are connected with leading rose growing nurseries. They represent the commercial angle, of prime importance because they are the people who must grow the plants and market them.

1952 entries at end of first blooming season in the International Rose Test Garden at Portland, Oregon. From these entries will be chosen the All-America Rose Selections for 1955 introductions.

The commercial judges are located at East Rutherford, New Jersey, with Mrs. Dorothea Bobbink White, incidentally at the nursery responsible for the lovely rose garden of The New York Botanical Garden; at West Grove, Pennsylvania, with Sidney B. Hutton; at Newark, New York, with Eugene S. Boerner; at Mentor, Ohio, with Gerard K. Klyn; at Pleasanton, California, with Clarence G. Perkins, and at San Jose, California, with Clyde H. Stocking, for the San Francisco Bay section; at Montebello, California, with Arthur Howard, and at Ontario, California, with J. Awdry Armstrong, for the coast and inland sections of southern California; and at Hemet, California, with Keith Monaghan for the desert area, a total of nine.

The non-commercial judges are located at educational institutions and important municipal parks. They are college professors, curators, park superintendents, or other prominent rosarians. Test gardens are operated and entries judged at Cornell University jointly by Dr. L. H. MacDaniels and Dr. Robert E. Lee; at Penn State College by Prof. Robert P. Meahl; at North Carolina State College, by Prof. Glenn Randall; at University of Florida by Prof. J. Hapgood Brooks III; at Southwestern Louisiana Institute by Prof. Ira S. Nelson; at Ohio State University by Dr. L. C. Chadwick; and at Iowa State College by Prof. Emil C. Volz.

Public park locations and judges include Hartford, Connecticut, with Everett A. Piester; Portland, Oregon, with Fred Edmunds; Seattle, Washington, with Adrian W. Gallaher; Minneapolis, Minnesota, with Richard S. Wilcox; Tulsa, Oklahoma, with Arthur F. Truex; and Tyler, Texas, with Dr. Eldon W. Lyle.

This makes thirteen non-commercial judges and nine commercial judges, a total of twenty-two official A.A.R.S. test gardens and judges operating in 1953.

There are, in addition to the twenty-two official judges, eleven demonstration gardens where the entries are scored by directors in charge. Most of these trials are conducted by commercial rose growers, horticultural publishers, and plant breeders. While scored and reported the same as at the official test gardens, they are either of apprentice nature or are considered too close to regular test gardens. Their scores, if averaged with those of regular judges, would be apt to give overbearing judgment for some sections or climatic conditions. Therefore, their scores are averaged and tabulated separately, unofficially.

Towards uniform judging, for fairest evaluations from year to year and for comparisons of value between classes or functional types of roses, A.A.R.S. has developed scoring schedules for tea and hybrid tea roses, for floribunda and polyanthus roses, and

New 1950 entries just beginning to bloom in the All-America Rose Selections test garden at West Grove, Pennsylvania

The rose garden of The New York Botanical Garden is one of the one hundred A.A.R.S. accredited public rose gardens. There, visitors to the Eleventh Annual Rose Day on June 11, 1953, will see the 1954 All-America Rose winners.

for climbing and pillar roses. Explanations on these point judgings are given in detail, and the writer has tried to impress on judges that average scoring is preferable to high or low pointing. We expect higher average scores from locations especially favorable to rose growing, and scores may properly reflect the conditions under which the roses are grown. Whether inclined to be lenient or severe in scoring, an A.A.R.S. judge must be consistent.

The trustees, as a whole, and especially their Scoring Schedule Committee, study the judges' scores very carefully and question any seeming inconsistency. Only when the Test Garden Committee and the Scoring Schedule Committee approve of the test garden and the scoring does a new judge become a full judge, with his scores averaged with those of the other judges.

Requirements for a test garden provide for proper and regular spraying or dusting against diseases and insects, as would be recommended to any home gardener or for any public rose garden. Reasonable cultivation or mulching, feeding and watering, pruning and protecting against extreme cold in winter where hilling up is advisable are required for growing good roses. A.A.R.S. judges must provide such facilities for test plants. The entries must be given a fair opportunity to demonstrate their merits.

Since a tremendous amount of publicity attends an All-America winner, it is desirable that the public should be able to purchase plants conveniently from many reliable sources of supply. This requires a large number of plants for introduction, a hundred times as many as were sold of a good new rose before A.A.R.S. This is more than any one firm could afford to grow, so A.A.R.S. members cooperate in growing, under the owner's license and from buds originally supplied by him, the quantity required for successful introduction.

It is remarkable that, in a dozen years, and including those of World War II, the sale of All-America Rose Selections has climbed from zero to almost thirty percent of all the rose plants sold by leading growers in America. For an estimate of twenty-five million roses grown and sold in America per year, A.A.R.S. members bud nearly eighteen million plants. Not all of these produce salable plants but the budding figures of these important growers are accurate and confidential.

The backbone of All-America testing lies in and with the judges. Their responsibility is becoming tremendous, and they are scoring studiously and carefully. Our appreciation for dependable guidance should be shown to them. However, that the public might take no one's word for what is especially meritorious, A.A.R.S. is supplying a bed or part bed of the new winners free to over a hundred public rose gardens. These plants will start blooming in this latitude in early June, which is announcement time for the 1954 winners. They will be on display this season in The New York Botanical Garden rose garden, one of the hundred A.A.R.S. accredited public rose gardens.

A.A.R.S. wants not only to help keep public rose gardens attractive and up-to-date but wants the public, the prospective rose planters, to see these new varieties during the season before they are offered for sale. Thus individual rosarians have an opportunity to judge these new roses themselves to see whether they like them enough to purchase plants.

All-America Selections, for pre-introductory testing and screening of flower and vegetable varieties from seeds, was started in 1932. Roses have been tested similarly since 1939. Camellia testing started in 1951, and gladiolus testing is beginning this spring of 1953. It is hoped that eventually new varieties of all horticultural families will be thoroughly screened and rated before being offered to the public. Gardeners and planters, amateur and professional, deserve that dependable guidance.

Iris

Its History from 1935

By **Kenneth D. Smith**

Lady Ilse, originated by Kenneth D. Smith

JOHN C. WISTER, in the March-April number of this publication, has written the history of Iris to the year 1935. In the subsequent years, those in which I became interested in hybridizing, it would seem as though an atom bomb had been exploded and had blown everything wide open.

Dr. L. F. Randolph, of the New York State School of Agriculture, became interested in the chromosome count of irises, and he found that hybridizers had, without realizing it, graduated from diploids into tetraploids. They had also run into difficulties, particularly those practising line breeding, for many of their originations lacked substance. In the February 1953 issue of "Gardening Illustrated" (England), N. Leslie Cave has written an excellent article entitled "Is Iris Losing Its Stamina?" He states, "Many of these breeders, probably the majority, practise line breeding, i.e., they cross closely-related plants again and again and again, and this close in-breeding is, I am afraid, having its effect on the irises we are now getting. It has intensified the tender traits and, if carried on still further — and there seems to be no cessation — may result in the production of more and more weaklings."

Fortunately, some of our American hybridizers, who were known for their line breeding, are now taking a different approach to the matter. America is a vast country with many climatic differences, and, I believe, it is impossible for any tall bearded iris to be developed that will perform equally well in all sections of the country. But there is no reason why irises that perform well in Climatic Zone VI should not do equally well in Zones V and VII. What we want are irises produced in Zone IV to do well in Zone VII.

It is truly amazing what has been accomplished in iris breeding since 1935. I know of no field of endeavor in the breeding of plants where progress has been made so rapidly. This also has its disadvantages, for many of these new introductions are quickly superseded by others, and the iris collector finds he has an obsolete collection, unless each year he adds new things to his collection. Colors unknown in 1934, particularly bright clean, clear colors, have been obtained. The form of the flower is radically different; instead of open standards and hanging narrow falls, we have closed standards and flaring falls with wide hafts. Some flowers are delightfully ruffled, and the objectionable lines at the haft of the flower have mainly been removed. The life of the individual flower has also been prolonged, so that some of the newest originations remain open three or four days.

In the breeding for pink irises, the honors fall to David F. Hall, a retired Illinois attorney. Originally he had produced many colorful blends, but in 1942 his series of "Flamingo Pinks" with tangerine beards broke forth. By intensive inbreeding, he succeeded in producing larger and larger flowers on taller stalks. Dozens of these are now named, and in 1951 his "Cherie" won the Dykes medal. One of the delightful things about some of these pinks ("Chantilly," for example) is the picoteed or fluted edges of the flower. This is not a Hall trade-mark but comes from "Matula," one of the Sass irises which Mr. Hall used in breeding.

Paul Cook of Bluffton, Indiana, has practised line breeding more intensively than any one else. Honors fall to him in the dark velvet purple class with "Sable" and its descendants. Some of his "mauve" pinks have proven outstanding as garden clumps; namely, "Dreamcastle" and "Harriet Thoreau."

Grieg Laphan, also of Indiana, has produced outstanding reds, particularly "Christabel" and "Red Gleam."

The Sass brothers from Nebraska, pioneers in hybridizing, still continued to make iris history after 1934. They produced a vast number of plicatas and created colors unheard of before. "Siegfried," the brown plicata, came first, then a succession of plicatas in rose, yellow, and blue tones. "Blue Shimmer" is one of the loveliest of all of them. From this plicata breeding came the "lemon ices," "Elsa Sass" and "Mattie Gates." Another big break was that aptly named blend, "Prairie Sunset," which has been of invaluable use to hybridizers. The yellow "Ola Kala" won the Dykes medal in 1948. The Sass brothers also produced the variegatta "City of Lincoln," and many other fine things, including "Red Torch," which really has red velvet falls. Were it not for their creations, many of our present-day irises could not have been produced.

Another man, whose originations are also responsible for many of the modern irises, was Ferdinand Cayeux (France). His introductions covered practically the whole color range; in the period from 1936 through 1941, he received fourteen Awards of Merit from the American Iris Society. "Jean Cayeux" and "Madame Maurice Lassailly" have proven themselves invaluable parents, as many American hybridizers can testify.

Still another old timer, Dr. P. A. Loomis of Colorado, continued to make iris history. His hybrid "Elmohr" (part tall bearded and part oncocyclus) won the Dykes medal in

1945. When well grown, his pure white "Spanish Peaks" is, perhaps, our best white iris. And we must not forget that, were it not for his "Morocco Rose" and his series of pinks with tangerine beards, many of the present-day hybridizers would not be producing pinks.

When the name Dr. R. E. Kleinsorge is mentioned, one instinctively thinks of blends. He seems to have a corner on them. All are most colorful and most appropriately named, for instance, "Daybreak," "Grand Canyon," "Tobacco Road," "Bryce Canyon," "Cascade Splendor," "Chamois" and "Cordovan." Personally, I consider "Cascade Splendor" his greatest iris, because it is beautiful in its own right and has given outstanding seedlings for myself and for the Doctor: also for any one else who has been clever enough to see its possibilities. Lately Dr. Kleinsorge has been working with the brown tones; his "Pretty Quadroon" is rather similar to the American 1952 Dykes winner, "Argus Pheasant," created by Fred De Forest, also from Oregon. De Forest is breeding along similar lines but has branched out into the pinks — and who can resist trying his hand at them?

One of the most amazing iris, a hybrid named "Lady Mohr," was originated by Carl Salbach of California and won the Dykes medal in 1946. Prof. Sidney B. Mitchell, another old hand at breeding iris, received an Award of Merit in 1937 for his orange iris, "Naranja." It was not until ten years later in 1947, that Mr. and Mrs. Charles G. Whiting received an Award of Merit for a child of "Naranja," which they named "Rocket." This illustrates that while it is possible to have seedlings bloom in two years from making an iris cross, it sometimes takes years before one can improve on an existing variety.

Dr. Robert J. Graves of Concord, New Hampshire, with his able assistant, Edward Watkins, proved it was possible to use a runt and do something with it. Their "guinea pig" was the English iris, "Gudrun." Working primarily for the perfect white and producing such iris as "Snow Carnival," "Lady Boscawen," "Sarah Lee Shields" and "Helen McKenzie," Dr. Graves also produced some pale blues, one of which, "Helen McGregor," received the Dykes medal in 1949. A child of "Helen," "Jane Phillips" has proven to be as fine a parent as one could desire, and many prefer it. Harry Randall (England) crossed "Jane Phillips" onto "Cahokia" and in 1952 received the English Dykes medal with "Seathwaite."

Right. The new iris garden of Mr. and Mrs. Kenneth D. Smith at Dongan Hills, Staten Island, is a rainbow of the best varieties.

Below. Catherine Hemingway Smith is examining the new iris border in her garden.

"Cahokia," a soft blue, and "Pierre Menard," deeper in color, were midwest originations of Miss Eva Faught. They are not only outstanding blues but have been used extensively in breeding. Orville Fay, as well as Harry Randall and myself, have found "Cahokia" a fine parent. Fay, one of our outstanding new American hybridizers, has been most careful in his choice of parents. He has used extensively "Snow Flurry" (Rees) and "Gloriole" (Gage). Being a neighbor and good friend of David Hall, he has access to the Hall pollen. As a result,

(Continued on page 80)

Recent Activity with

HARDY PRIMROSES

By **Charles G. Crawford**

The "Clarke's Strain" of polyanthus primrose is especially noted for hardiness and clear color

THINKING back, I find I have been growing hardy primroses for many years — at first with only moderate success and little encouragement from others. From time to time I would gather enthusiasm from articles in English garden publications. They were complete enough — but still I would have to hunt for seeds of the species and strains mentioned and frequently when I did locate the seeds, they would be too old or too few.

However, things have changed and let me tell you how. In the past few years, I have found inspiration and good advice from the American Primrose Society and also from cultural notes on primroses which have been included in the "Bulletin" of the American Rock Garden Society. Cultural notes stressing shelter, soil conditions, and drainage from correspondents in different parts of the country have also interested me. And getting fresh primrose seeds from various parts of the United States and from foreign countries has proved exciting, for often a note to the supplier brings forth a very informative letter. This information has made it possible for me to adjust the growing of hardy primroses to Ohio conditions.

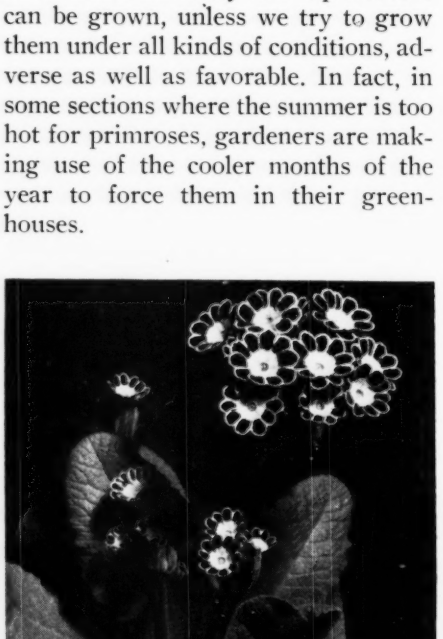
Another important factor in the gathering of and disseminating cultural information on primroses is the primrose testing program of the Men's Garden Club of America. As chief primrose tester, I am often asked, "How many testers are there?" "What do they do?" "What are the tests for?"

There are one hundred testers all over the United States—some of them live in very poor climates for growing primroses. But we believe we shall never know definitely where primroses can be grown, unless we try to grow them under all kinds of conditions, adverse as well as favorable. In fact, in some sections where the summer is too hot for primroses, gardeners are making use of the cooler months of the year to force them in their greenhouses.

The local tester for each club is one who likes to grow the more difficult species and varieties which take special care and cool situations. (Primroses thrive when the temperature ranges between 50° F. and 75° F. They seem to be dormant when frost is in the ground and just about dormant when the temperature rises to 80° F. or above, even though they have ample moisture.) It is his responsibility to find out if he can grow primroses successfully where he lives and to use his knowledge in interesting others to grow them.

It is my responsibility, as chief tester, to keep close track of the work of the local testers, especially during the months of December, January, February, and March, for that is the time for seeds to be supplied and started. A later start is more likely to result in failure.

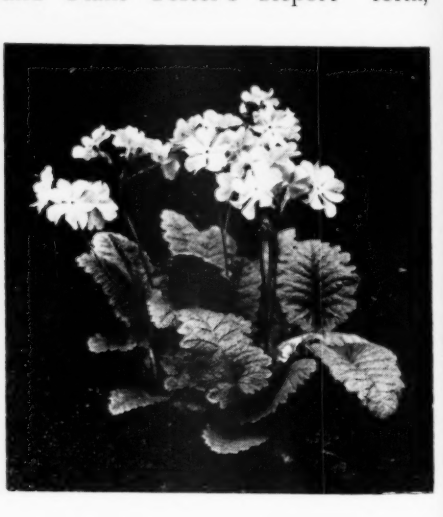
In the primrose testing program, the Men's Garden Club of America has been receiving full cooperation from the American Primrose Society. It has prepared a very complete "Seed and Plant Tester's Report" form,



Above. A well-grown plant of primrose "Gold Lace," the result of hybridizing by Mrs. Florence Levy, of Gresham, Oregon.

Left. *Primula denticulata.*

Right. *Primula Sieboldii.*



which is filled in by the local tester at the end of the season and thus enables me to have on record a pretty complete picture of the growing conditions for a particular year.

I should like to quote from Mrs. Florence Levy, former editor of the "Quarterly" of the American Primrose Society: "In past years, I have been laboriously writing and advising people all over the United States how to grow primroses. With these test reports, it will take the 'guess' out of advice, for sometimes only a few miles makes a difference."

The chief tester does a lot of so-called research on primroses. He tries to grow all he can and keep well informed. He seeks out the best breeders of strains of hardy primroses and obtains seeds which he supplies to the local testers, along with cultural information. He studies their reports — and their reports are also studied by some one appointed to do so by the American Primrose Society.

Last year, as chief tester, I was able to supply the local testers with seeds of the same species and strains from a number of primrose breeders; and for the coming year I have already accumulated seeds for them from sources in this country, England, and Holland.

There is a lively interest in the many new strains of polyanthus primroses. All are somewhat different in color range, size of flower, and hardiness. In size, the individual florets may reach one and one-half to two inches in diameter, with nine- to twelve-inch stalks. The best seeds come from hand-pollination — and the fewer the seeds and the higher the price, the better they are. Seeds can often be had in separate colors, such as white, yellow, gold, bronze blends, flame-scarlet, dark red, carmine-rose, pink, pastel blends, light blues, and violet blends.

Among the polyanthus strains being tested — or expected to be tried by our testers in the near future — are: Clark's polyanthus colossal strain mixed; Texel's polyanthus colossal strain, pastel shades; Barnhaven's and Tercher's polyanthus "Silver Dollar" strains, extra giant-flowered; Pacific strain of polyanthus, many colors and violet; Somerset's blue-flowered shades; Chittick's giant-flowered strain, Attwood's strain, Ostago Superba strain, Watkins' Tango shades — these four from New Zealand; and Tango Supreme from Australia.

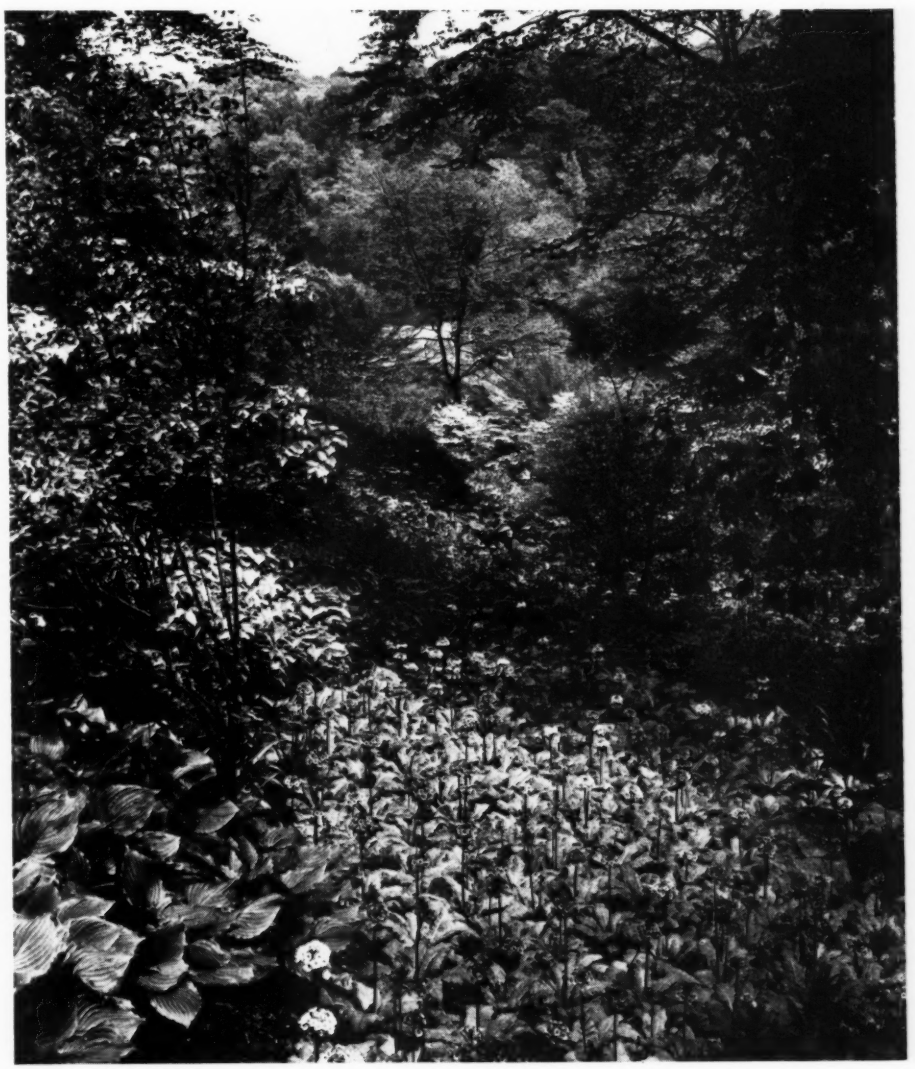
Although the strains from New Zealand and Australia have been many years in the making, it is only recently they have come to our attention. The "Tango Supreme" strain has very large flowers and the stalks are quite tall. It would seem that the word "tango" is used in Australia to denote more the color than the strain. Seeds from New Zealand and Australia arrive fresh in February, and no trouble is experienced in their germination.

Hardy primroses can be forced a month or so earlier and used in window boxes or can be grown in a lath house. These are raised from seeds, but when an especially nice one is noticed, the clump may be divided. In fact, when the clumps become sizeable, it is well to divide them into small plants for good flowering.

After he has succeeded with polyanthus, a gardener then finds that there are four or five species of primroses which he wants to try next. Of these, *Primula denticulata* is about the first to bloom, a round head of blue or white florets on a six- to eight-inch stem. Blooming about the same time is *Primula rosea*, with its variety "Delight" grown from seed. It produces large dark rose flowers, at least an inch in diameter, and grows six inches high. This variety is very new, but is so superior that I predict it will enjoy great popularity in the future. Here's a cultural hint — keep "Delight" well watered.

Primula acaulis follows the above. It may be described as a low "bunch" primrose with a number of single stems rising directly from the ground,

(Continued on page 80)



***Primula japonica* finds congenial conditions in this naturalistic planting on the estate of Mrs. F. B. Crowninshield at Montchanin, Delaware.**

A ROCK GARDEN

in the Mountains

By **Clare W. Regan**

A ROCK GARDEN located at six thousand feet in the northern tier of states, would seem to be an ideal place for alpines. This is true in some respects. However, it is even more true in regard to plants from sub-alpine zones, semi-arid regions, the higher and drier countries of Asia Minor, and those bordering the Mediterranean. Such a statement might sound preposterous, in view of the very severe climate here, until one marshalls all the facts. Then it became obvious that plants from these regions are more accustomed to rigorous conditions than the more sheltered alpines. The latter seldom appear until June or July and emerge from their snowy sanctuary into the settled conditions most favorable for rapid completion of their year's cycle.

In my Montana garden, the winter's snow is usually gone by mid-March. After that date there ensue weeks of hard freezes and thaws, snow and rain, and icy winds that not only freeze the evergreen foliage so characteristic of many rock plants, but destroy it from excessive evaporation. Such weather is normal in springtime in foothill regions and on the high, dry plateaux of the West, even in areas that approach desert conditions after the spring rains are over. From my plant experiences this is probably so in similar situations throughout the world; and plant material from them is singularly immune to viccisitudes of climate, when compared to the more sheltered plant-life of the higher peaks. Two expanses of the earth's surface, however, defy me in my endeavors to grow plants from their confines: the first is the eastern section of our own United States from which at the present moment I have two plants from lowland regions and two that are, I believe, from higher elevations. The other country is New Zealand. I have never kept a single plant "over winter," and so the white gentians, wahlenbergias, that spectacular buttercup, *Ranunculus Lyallii,* and the wonderful ericaceous plants from there are denied to me.

A "Juliana Hybrid" primrose, Dr. Matthew C. Ritter origination

Barring these unobliging countries or, in my own case, the area east of the Mississippi, there are still so many charming plants able and willing to put up with conditions here, that a book would be needed to tell of the delights of growing them. As the little members of a much maligned plant family are among the earliest to bloom, it is well to start with the drabas that give so much more than they are ever credited wtih. *D. polytricha* is a woolly, rosetted, ground-hugging native of the Caucasus. In earliest spring it looks like a hairy moss covered with tiny golden flowers. Two very rare plants in cultivation come from our own mountains. *D. Paysonii,* which was collected by my own trowel many years ago in northern Montana, is a loose mat of fat leaves covered, it seems, with a crystal dust. It, too, has golden flowers. The other treasure, *D. eriobata,* was sent to me by botanizing friends from the Lost River Mountains of Idaho and is very little known — in gardens at least — and so very wee that it is likely to be overlooked by almost everyone, until it bursts into a perfect forest of tiny stems mounted by even tinier white flowers. But the main glory of these small members of the Mustard Family is the lovely foliage, in assorted rosettes and trailing stems, which never has the flabby appearance after blooming that detracts so much from the beauty of many rock garden plants. With the flower stems nipped off, draba returns to its original crispness and contributes freshness of aspect to my rock garden.

Silene acaulis is often called the "typical alpine" and is, indeed, very pretty with soft rose flowers above bright green mats, especially when it grows and blooms with its chosen companion of the mountain heights, *Eritrichium argenteum.* Both are lovely in nature, blooming heavily so that the patches of pink and blue form exquisite contrasts between the grey stones. But try to get them to repeat this performance at a lower level! To compensate partially for their refusal to bloom — and the little "forget-me-not" doesn't even try to live — there is *S. acaulis* var. *pedunculata* which does bloom, holding pinkish-mauve flowers on stiff stems above prickly foliage. The tiny forget-me-not, *Myosotis rupicola,* can be a stand-in for the woolly eritrichium, having the same heavenly blue color, but it is a giant of three inches compared to its wee relative, which can claim no more than a fourth of an inch, flowers and all. It is interesting to note that *Silene Hookeri* from California never does well, nor does the eastern *S. Wherryi;* but not so surprising, *S. Keiskei* from Japan scarcely attempts to grow at all. I am consoled, in some measure, for the very negative attitudes assumed by these silenes, when I look upon the recently discovered, or properly, recently introduced to gardens, *S. Petersonii* from rock slides and high screes on Utah's mountains. It has sparse tufts of hairy leaves and lovely trumpets of either pale or deep rose flowers rather sparingly produced. The small double *S. maritima plena* is a treasure with double carnation-like blooms of white, though on a very lilliputian

scale. No doubt about its ability to live and grow here; in fact, it shows almost too much vim and must be dealt with, when it begins to take over its neighbor's territory.

Primulas of many kinds range the rock garden and bloom, according to their kind, almost all summer. The first to appear is *P. angustifolia* from Colorado, whose pointed, shiny green leaves can hardly be distinguished on first appearance from its cousin, the dodecatheon. The flowers are glowing and satin-finished, of a fine rose-mauve with a suggestion of blue; the stems are but one-half inch in height. From the Caucasus comes the next arrival, pushing up very dark bronze-colored and extremely rugose leaves in mid-April. This is the very rare and choice *P. amoena*. The flowers follow almost immediately and are wine-colored bells, on six-inch stems, with a darker zone down the center. A European primula now dominates the scene, being none other than the well-known and beloved *P. marginata*. This is decidedly a crevice lover, liking part shade and a backing of limy soil. The leaves are almost lobed, edged with silver, and heavily mealed, as are the beautiful and fragrant lavender flowers. The form Linda Pope is larger and the color of the flower is an ethereal pale lavender, but it is not as good a doer as the type. *P. rubra* (late *P. hirsuta*) now displays slightly belled flowers of vivid magenta, with a lighter center zone of white. So do many of its hybrids, breaking down into lighter or darker shades of the predominating color of the parent plant. These are known collectively as "pubescens hybrids."

One of the most dependable and charming of all primulas, and representing at present the farinose group, is *P. frondosa* from the Balkan states. It is similar to *P. farinosa* but more reliable in staying powers and blooming habit. It is very heavily mealed on the underside of the leaves, which are shiny above, and bears rosy flowers in small umbels on short stems. *P. frondosa* grows in a very hearty manner and can be divided frequently so that soon one can have a little slope covered with its fairy blooms. *P. Juliae* is the mother of all the hybrids that bloom so gorgeously in early spring and are known, en masse, as P. x Juliana Hybrids. Probably one of the most famous and prolific of plant-mothers, she herself has great claim to beauty in the clear red-purple of her flowers, displayed with such abandon close over the ground-hugging mats of small, almost circular, dentate leaves. *P. Juliae* is a Caucasian.

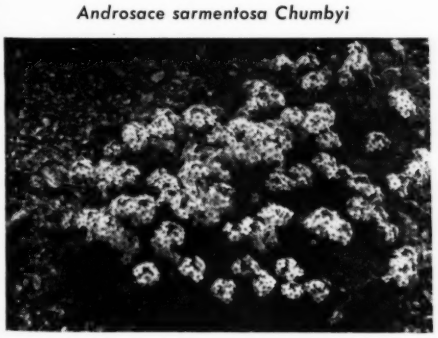
The Arthritica Subsection of Auricula has a full representation in my garden: they are *P. Clusiana, P. glaucescens, P. spectabilis,* and *P. Wulfeniana.* With the exception of *P. Clusiana,* I cannot say anything about the flowering of these plants. They sit, year after year, grimly determined not to yield a flower, and keep to their resolution in spite of every blandishment in the way of fertilizers, leaf-mold, and everything the normal primula might be thought to crave. They are low-growing plants with leathery leaves, some with cartilaginous rims, and three of them have pointed glossy leaves. The fourth, *P. spectabilis,* has a rounded form at the leaf-tip and the surface is noticeably dull, made so by small punctures of the epidermis. While all these species are native to the Central Alps and outlying districts, and all occupy the same rich scree-bed in my garden, *C. Clusiana* alone produces any flowers, usually every other year. The blooms are large, deeply notched in the petal, and are a pretty claret paling to white at the center. The two rare and choice natural hybrids of *P. minima* and *P. glutinosa, P. Salisburgensis* and *P. bicolor,* do no better and, while they grow well, never have bloomed. Not that any of these plants feel any personal animosity toward my garden, its just their way. They are shy bloomers in anybody's garden.

After the mulish dispositions shown by the above, it is a pleasure to speak of the tiny *Primula Clarkei,* which came to me via the mailman last spring and then flowered the whole summer through. It came from Kashmir at an altitude of about eight thousand feet and, if it survives this winter, should be one of the best and loveliest of all the miniature primroses. It has rounded, toothed leaves and tiny, pink flowers of great clarity of color. Another in the same class, *P. Tyrolensis,* has very small, flattish rosettes of sticky leaves and produces fine red flowers on very short stems. It was not easy to please but seems now to have settled down in an east-facing crevice.

Of the lovely belled primroses from western China, Tibet, and northern India, nearly all are exceptionally hardy. They belong to the Sikkimensis Section. There are the two Nivalids, *P. chionantha,* with waxy white blooms faintly suffused with blue, and *P. sinopurpurea,* with bluish-purple flowers; both hail from high altitudes in Yunnan. And, lastly, there is our own *P. Parryi* from the Rocky Mountains. This is said to be as skittish to bloom as any from the Himalayas or Alps, but in my garden it bears each year large, inch-wide, crimson flowers held in a close umbel. The color is rich and glowing. *P. Parryi* is one of the most beautiful of American alpines, though far from alpine in appearance.

Androsaces are typical rock plants. The loveliest to me are the woolly rosetted types, which are very hardy and hold forth on a hot dry slope, where the wandering little "woollies" can root between the stones. Being close relatives of the primulus, they show the relationship by producing their flowers, which may be white or pink, in gay umbrella-like clusters over the silken foliage. The Sarmentosa Section is best represented in the rock garden by the variety *Chumbyi,* very woolly and very pink, and the species *A. primuloides,* somewhat greener and with lop-sided rosettes. The flowers

Androsace sarmentosa Chumbyi



Androsace villosa

are pinkish-lavender. *A. sempervivoides* is scarcely woolly at all, is more compact with much smaller rosettes, and smaller "umbrellas" of very soft pink, with a red eye. Another species which came to me under number (Capt. Sherriff) is very tiny and has even smaller and shorter clusters of the typical pink flower. In fall the leaves show beautiful tints of coral and crimson. These are all from regions near the Himalayas.

Europe has the lovely small white *A. villosa,* more cobwebby than shaggy; and its wee version, *A. villosa arachnoidea,* is more compact, more fluffy, and even more covered with tight silken hairs. In early spring it is a complete mass of tiny white flowers with a pink eye. Nor do we have to go without an androsace of our own, for the Rocky Mountains hide in their vastnesses a small beauty, *A. carinata.* Like the above, it has tiny white flowers which turn pink at maturity, and a perfectly heavenly aroma. The rosettes are open and grey hairy but not arachnoid.

The mossy types are all, it seems, versions of *A. carnea;* the best-known are *Halleri* and *Laggeri.* The blooms are very like our Montana native, *Douglasia montana,* which makes gorgeous patches of pink on our bare foothills in April and May. *Douglasia Vitaliana* is European and has rather coarse prickly foliage, in earliest spring covered with brilliant golden-yellow blooms.

Part II of "A Rock Garden in the Mountains" will appear in the July-August issue.
— Editor's Note.

PRIMROSES (from page 77)

each carrying a single flower. These flowers get as large as the largest polyanthus blooms. Another species, *P. Sieboldii,* is appreciated for its pink and white flowers and for its habit of not remaining above ground in the hot summer for attacks by red spider.

Primula japonica and its varieties are handsome members. The best type is deep red, but there is a fine large-flowered, pure white, called "Postford White." The japonicas bloom from early in June to the first of July.

The Asiatics, or candelabra types, are somewhat more difficult to grow but will bloom in light shade, if well watered, clear into August. They are available in a wide range of colors, cream to orange, lilac to purple, pink to crimson. To grow them successfully is an achievement. There are also rare species, so finicky in their requirements that they really test a grower's skill — and try his patience. All in all, this group of plants offers wide scope to gardeners, some of its members being easily satisfied and others proving very challenging.

IRIS (from page 75)

he has far outdistanced contemporary hybridizers. His pink "Mary Randall," his cream "Desert Song," his white "New Snow," and his yellow "Truly Yours" are among the tops in their respective classes.

Robert Schreiner of Oregon has produced an iris approaching black, called "Black Forest." It really has velvet on it. Another of his iris, "Mulberry Rose," is unique in its color class and very decorative in the garden.

My breeding has been quite unlike that of anyone else. I do not believe in line breeding except to a limited degree. I believe out-breeding is very necessary. And I have another theory, that is, iris are not produced by chemists. Iris are created not by making up prescriptions, but by a feeling we must have within us which instinctively causes us to make the correct cross. Many will disagree with me, but I think my experience proves my point.

Thousands of iris seedlings are produced each year; it has been said only one in a thousand deserves to be named and introduced. In 1937, I bloomed my first six hundred seedlings; eight of them were named and introduced. Six of these received Honorable Mentions from the American Iris Society, and four later received the higher Award of Merit. Three of these, "Lord Dongan," "Violet Symphony" and "Pink Ruffles" still stand unsurpassed in their color classes. The point is — I had no experience in Iris breeding. I did not know what a diploid meant, but I did have an appreciation of beauty, plus imagination. I made chance crosses but used good parents. My ability in pictorial photography, where I had earned international recognition, made me a good selector in the choosing of seedlings.

In the beginning I was primarily interested in the yellows, but I wanted iris in all color groups. I never believed in growing more than fifteen hundred or two thousand seedlings, for it then became impossible to make the right selections. It was a chance cross that started me on my blue line, and even now I am not sure of the parentage of "Lake George." But it undoubtedly comes from a Cayeux iris, perhaps the plicata "Ariane" and my white "Mt. Robson." This was what may well be called a break, because the so-called blues were really lavender, and this iris with very flaring falls was more truly blue in color than any iris at that time. From this came "Blue Valley" and "Keene Valley." Crossed outwardly on "Jane Phillips" and vice versa, I secured "Lady Ilse," "Serene Valley," "Precious Days" and "Grasmere." Using "Lady Ilse" on "Cahokia," "South Pacific" (H. C. '52) was produced, which capable iris judges proclaim as the "outstanding" blue.

"Golden Hawk's" breeding ran along similar lines — in- and out-breeding, but in the final process I used my "Admiration" and Kleinsorge's "Cascade Splendor."

"Helen Collingwood," a neglecta (soft lavender standards and rich purple falls) came from my intense velvet pansy-purple and lavender "Louise Blake," crossed onto "Extravaganza" (Douglas). "Caroline Burr" (K. D. Smith) a soft cream, gave Geddes Douglas his well-known "Amandine." By using "Gold Ruffles" (Muhlenstein) on "Amandine," I secured "Spellbinder," a lovely oyster-white and cream with a picoteed edge.

In the variegatta field, I secured "Staten Island," which has received Awards of Merit from both the American Iris Society and the Royal Horticultural Society. It is now considered the top in its class and performs well in all sections of the country. I feel that my particular line of crossing, in- and out-breeding, has given me a race of hardier irises. Orville Fay seems to be following along similar lines. But neither of us, nor any of the other hybridizers, has reached the ultimate goal — I think it unattainable. However, that will not deter me, nor any other seriously interested iris enthusiast from continually trying to reach it.

MAKING PLANTS GROW BETTER

By **Firman E. Bear**

The following article is based on the lecture Dr. Bear gave in the Downtown Lecture Series of The New York Botanical Garden.

— Editor.

Soil is made up mostly of substances that plants don't need and can't use. It is the residue that remains after rain, wind, heat, and cold have acted upon the rocks over many thousands of years. Over ninety per cent of the soil is silica, alumina, and iron, the first two of which are virtually useless to plants, and only a mere trace of the third is required by plants. This rock residue that constitutes the soil is essentially indestructible. The primary problem in soil management in a region like this is that of keeping the soil in place — preventing it from washing away. For soil, like the water that runs over it and drains through it, tends to move down hill.

Garden Soil

Usually the soil in a garden is not a natural soil, but one that has been relocated and reinforced. It may be mostly subsoil from the spot where the basement for the house was excavated. It may be a mere coating of soil over rocks, cans, bricks, or a great variety of other debris. It may be diluted with coal ashes. It may have been subjected to the injurious action of waste water. It may look very productive on the surface but have a very unproductive subsoil beneath. The uncertainties of origin of garden soils present many very troublesome problems.

Plant Roots

Every element that a plant requires, save carbon, is obtained from the soil by way of its roots. These roots are, by and large, the most important part of the plant. But roots are hidden from view, and we have no way of judging their condition except by the appearance of the tops of the plants to which they are attached. Plants sometimes grow fair tops without having very good roots. They may have good roots and poor tops. But plants do best only when there is proper balance between tops and roots, and when both make sturdy growth. Roots should have a clean white appearance. They should develop somewhat more rapidly than the tops. Excess moisture and excess nitrogen must be avoided during the early stages of growth, if this is to be accomplished.

Soil and Roots

For good root growth, soil must be well drained, well supplied with the right kind of organic matter, well limed, and well fertilized. If air can't readily get through the soil, neither can roots. If the soil is deficient in well-rotted organic matter, young plants often have difficulty getting their root systems established. If the soil is acid, roots of most plants are dwarfed, and they take on a rusty brown color. If the soil is not well supplied with mineral elements, especially phosphorus and potassium, root growth is limited. The test of conditions in a soil is found in the root development of the plants growing on it. When weeds or extra plants are pulled out, their roots should be carefully examined. They should be white and clean when washed with water.

Soil and Air

One can readily tell whether or not a soil is well aerated by the color of the soil and subsoil. It is abundantly worth while to dig a deep hole at some convenient spot, one big enough that you can get down into it, and to look at the color of the soil profile exposed on the sides of this hole. If the topsoil is brown and the subsoil is red or yellow, the soil is well aerated. The brownish color on top indicates a good supply of organic matter. If the topsoil is gray or black and the subsoil is mottled blue, green, or gray, the water and air are being held in one place too long. Black soils, *in this part of the country,* are wet soils. If soils indicate poor aeration, use may be made of tile, rock wells, crude types of organic matter, and lime to good effect. These aid in developing better roots. The holes left behind when roots decay provide drainage channels for air and water. But the important point is to get the water drained out of the subsoil, so rain can move down through the soil and any excess can be carried away.

Soil Organic Matter

Soil is something more than the rain-washed residues of rocks. Mixed with these residues are varying amounts of organic matter. This organic matter is a very important part of the soil. It is the food of countless millions of soil microbes. It is the food of burrowing earthworms. It is the source of all the natural supply of nitrogen for plants. That of recent origin contains all the elements required by the next generation of plants. Thus when a fresh green cover crop is worked into the soil, everything contained in it can be used again by the planted crop that follows, once the soil microbes have digested it. Soil organic matter that is so far decomposed as to have lost its identity, in which state it is called humus, has phenomenal capacity to improve the working qualities of soils. It also serves as a highly effective buffer against too much acid, too much lime, too much fertilizer, or too much poison residue that may be left on the soil. This humus also serves as a storing agent for nutrients applied in the form of lime and fertilizer.

Compost

Every first-class gardener will want a compost pile. Good compost can easily be made by piling layer on layer of grass clippings, leaves, finely-cut trimmings from shrubs and vines, and kitchen refuse, scattering a little lime and fertilizer over each layer, and then keeping the heap reasonably moist. You should use about three pounds of lime and ten pounds of a 5-10-5 or similar fertilizer for each one hundred pounds dry weight of refuse. It is important to remember that green materials often contain over ninety per cent water, so that one thousand pounds of them will be required for one hundred pounds dry matter. More rapid rotting and better compost is produced by turning the heap from time to time. The pile must not be too compact. Tree leaves that curl on drying are much more readily composted than those like oak leaves, which lie flat.

Peat

Peat moss and cultivated peats are the easiest, cleanest, and most satisfactory humus-making materials that one can buy for use around the yard and garden. Peat moss is improved by being subjected to winter weathering. It should be purchased in the fall and left in the open all winter. If left on top the soil, it tends to float off, so it should be weathered in a heap and then worked into the soil. Used liberally, regularly, and rightly, peat products produce exactly the kind of soil effects every gardener desires.

Chemical Soil Conditioners

A considerable variety of synthetic organic soil conditioners are now available for purchase. These are factory-made substances that are designed to bind the small clay and silt particles together into aggregates, or crumbs, and to keep them in this form for some time, possibly several years or more. Conditioners differ considerably in their effectiveness. They can be used to stop erosion, as on a slope in a newly-seeded lawn. They can be used to prevent crusting, so that small seeds can be gotten up to a good stand. Their most important use is that of conditioning the soil to a depth of six or eight inches. Most soils in poor physical state can be made to have excellent working qualities by the use of a good soil conditioner. The powdered forms are preferable for conditioning a considerable depth of soil. They should be applied when the surface is relatively dry and thoroughly mixed with the entire volume of soil to be conditioned. After the next rain, or an application of water with a sprinkler hose, and after the soil has become reasonably dry, it should again be thoroughly worked. It should then stay in good condition for several years.

Liming the Soil

No other mineral substance produces quite as fundamental an improvement in the soil as lime. For other than acid-soil plants, lime should be used regularly. It should be worked into the soil, preferably in the fall, if conditions permit. For lime-loving plants, enough lime should be used to raise the pH value to between 6.0 and 6.5, but usually no higher. The term pH is employed to indicate the degree of acidity or alkalinity. A pH value of 8 indicates that the soil is alkaline, 7 indicates neutrality, 6 indicates slight acidity, and 5 indicates strongly acid conditions. In starting a new lawn or garden, an application of fifty pounds hydrated lime or one hundred pounds pulverized limestone for each one thousand square feet of area is suggested for average soils. It should be worked deeply into the soil. Thereafter, about twenty-five pounds of limestone, or half that quantity of hydrated lime, applied annually for each one thousand square feet of area would be about right. This might not be enough for very heavy soils, and it might be entirely too much for very sandy soils. The only safe way to deal with the liming problem is to have the soil tested from time to time. Generally speaking, it is better to use too little rather than too much lime. Pulverized limestone is much safer to use than hydrated lime.

Fertilizing the Soil

For average lawns and gardens, a 5-10-5 fertilizer (five per cent nitrogen, ten per cent phosphoric acid, and five per cent potash) is satisfactory. The fertilizer should be applied in early spring and again in late May. On lawns, a third application should be made after the first killing frost. Worked-in, spaded-under, and holed-in applications of dry fertilizer are usually more effective than surface applications. Liquid fertilizers, made by dissolving a dry fertilizer in water, can be used to good advantage along the row at seeding or planting time, and from time to time as surface applications. Some types are designed for direct application to plant leaves, but great care must be used to avoid injury from such applications. The total amount of fertilizer applied during any one season, if repeated each year, generally should not exceed forty pounds of dry product for one thousand square feet of area.

Acid-Soil Plants

For acid-soil plants, one must avoid the use of more than mere traces of lime. If the soil already contains too much lime, whether because it is naturally high in lime, because it has been liberally limed, or because lime has escaped into the soil from a cement or mortar-containing foundation, it can be made acid by the use of aluminum sulfate. The normal procedure is to apply ten pounds of this material to one thousand square feet of area, and to repeat the application from time to time until the condition is remedied. Oakleaf mold and peat moss are excellent materials for use at planting time around acid-soil plants.

Trace Elements

Plants require at least fifteen elements. These are carbon, oxygen, nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, copper, zinc, manganese, molybdenum, and boron. The last six of these elements are called trace elements, because of the very small amounts required. The soil normally contains enough of these elements to meet the requirements of most plants, provided it is well stocked with organic matter and has not been overlimed. The availability of all these elements, except molybdenum, is greatly reduced by liming the soil. So it is necessary to be on guard against overliming. Symptoms of deficiency of these elements are well known on crop plants but not on many of the garden plants. A number of trace-element products are on the market. They can be safely used in accordance with instructions on the containers, and they may have highly important effects.

Plant Peculiarities

Plants differ greatly in their soil, light, water, and temperature requirements. Some species, such as moss pinks, do well on rocks. Blueberries grow well on light sands; asparagus needs a very deep soil. Bluegrass, roses, and iris are lime-loving plants. Azaleas and rhododendrons grow best on acid soils. Nitrogen should be used liberally on grass, but need only be used sparingly, if at all, on beans, peas, and clovers. You must know your plants, and then proceed accordingly. But it is surprising what good results can be obtained with most plants by proceeding along the general lines already suggested.

Testing the Soil

The only sure way to know whether or not a soil needs lime and, if so, how much, is by testing it. A dozen thin slices of soil obtained by use of a trowel from that many spots, thoroughly mixed, and reduced to about one-half pint will provide a satisfactory sample for testing. It should be air dried in a clean place and stored

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Toward Hardiness in Rhododendrons

By **Clement Gray Bowers**

It is now well over a century since the expedition of Sir Joseph Hooker into the Asiatic hinterlands and the subsequent publication of his gorgeous work on The Rhododendrons of Sikkim Himalaya (London, 1851). There is a copy of this beautiful and monumental work, with its magnificent color illustrations, in the library of The New York Botanical Garden. This publication marked a sort of epoch in the history of the cultivated rhododendrons.

Prior to Hooker's time, and long afterward, rhododendrons were popularly regarded as primarily American plants. The first species to be cultivated in England was our common *Rhododendron maximum*. This was presumably introduced in 1736, although we do not hear of its blooming there until 1756. The next one was *R. ponticum*, native to southwestern Europe and the Caucasus, in 1763. Perhaps the alpine rose of Switzerland, *R. ferrugineum*, had been previously cultivated near its native land prior to these dates, but it never assumed importance comparable to those mentioned. The more important American species, *R. catawbiense*, did not reach England until 1809. These species were either pinkish or purplish in flower, and no brilliant color was added until the introduction of *R. arboreum* from India in about 1811. It flowered in 1825 and was almost immediately crossed with *ponticum*, *maximum* and *catawbiense*. This hybrid mixture, with the addition of *R. arboreum's* bright red color, seems to have been the basis for the great race of hardy hybrid rhododendrons which, until the present time, has held sway as the leading group of cultivated rhododendrons for gardens in the colder parts of the United States.

Hybridization and selection through the years greatly improved these plants over their wild ancestors. Hybridists here and abroad, among whom Anthony Waterer of Knap Hill, England, was preeminent, worked during the 1860s, '70s and '80s, producing great numbers of seedlings, among which such fine clones as "Lady Armstrong," "Atrosanguineum," "Charles Dickens," "Everestianum," "Album Elegans" and many other sorts, still popular in this country, appeared. Until after 1925, this is about all that happened of any significance for the colder regions of America, and, with few exceptions, the hybrid rhododendrons now offered in the trade which are suitable for sub-zero climates are limited to those which were produced sixty or seventy years ago. And insofar as their ancestry goes, it was mostly pre-Hooker in its origin.

With Hooker's introduction of new species, further breeding, carried on by British gardeners, produced added modifications of this hybrid race and the beginnings of other hybrid groups. By the last quarter of the nineteenth century, crosses with such things as had been found in Asia by Hooker and others began to assume importance in England, where the climate proved to favor them immensely. Flowers of larger size, clearer colors, and even yellow tints came into the list of garden rhododendrons, while further explorations extended the list of species, and new sorts quite different from the American kinds were introduced. The cult of rhododendron growing in Britain advanced steadily.

How extensively the new kinds were tried in America is not clear. A few Asiatic species arrived at Golden Gate Park in San Francisco as early as the 1880s and still survive. But the climate of the Northeast was unfriendly to nearly all of the new species from Central Asia, and it may be said that very few, of either species or hybrids, succeeded here. There were rare instances where something of merit, such as the hybrid called "Pink Pearl," was good enough to grow under glass and is still seen in flower shows. The slow process of propagation common to the genus also prevented rapid dispersion of new hybrid clones.

Around the turn of the twentieth century, the hybridizing of rhododendrons in Britain became quite important. It was then that Sir Edmund Loder's big white hybrid, known as "Loderi," got started and impressed people with its huge trusses of flowers, each blossom six inches or more across. Yellow hybrids of *Rhododendron campylocarpum* followed, as well as scores of other new combinations of species in which the newly introduced forms from Western China and Upper Burma entered prominently. New explorations were made and the names of E. H. Wilson, George Forrest, Joseph Rock, and F. Kingdon Ward became famous.

This went on for a quarter-century, during which time the enumerated species of rhododendron rose by leaps and bounds. With the new species, crosses were extensively made and new hybrid rhododendrons were born by the hundreds. The number of species now totals over nine hundred, and the hybrids, clones and otherwise, which have been given names is appalling, since not all of them are worthy of such distinction. The nomenclature has been further complicated by the giving of fancy names to hybrid populations, a practice now outlawed but one which resulted in confusion to purchasers of plants who found themselves in possession of variant seedlings instead of clonal varieties.

Among the newer species and hybrids, there have been many queer forms, such as the Cinnabarinums, the azalea-like Triflorums, and many little tabletop dwarfs from the arctic and alpine regions. These have come into cultivation wherever they can be grown and a few of them are very promising. In Cornwall, where the climate is like South Carolina in winter and not hot at all in summer and where certain palms grow outdoors, "tree" rhododendrons from the subtropical rain-forests of Asia can flourish in the gardens. There you will see old plants of *R. arboreum* sixty feet high and covered with red flowers from top to bottom. Other "tree" rhododendrons,

The flowers and foliage of the Dexter hybrid rhododend
those of the average Catawba hybrid *(above, left)*. Th
viduals may measure as much as four and a half inches
instead of the usual five. The large flowers of the D
Catawba flow

When compared with the average Catawba hybrid r
generally a bit broader, the Catawba *(left)* more upr
individually, may occur in smaller trusses in certain pla
the Dexter trusses are so

such as the Falconeris, will grow there, too, and develop trunks a foot or more in diameter. These things are impressive, but are not for colder climates — even in Britain.

With scores of fine new things available in many variations of form, size, color and, often, fragrance too, the British gardeners are picking the newest and best, leaving behind the old-time Catawba hybrids, such as those produced in 1880 by Waterer, as obsolete and no longer "worthy of being grown in British gardens." Beautiful blood-red hybrids of *R. Griersonianum* are presently most notable.

Our growers on the West Coast are able to do admirably with all the best British hybrids and Asiatic species, especially in the regions of Portland and Seattle, where the climate suits them well. But alas, the poor gardener who lives in New York or New England can get little satisfaction from these fine things and, for the most part, his only recourse has been to the old varieties of 1880 or the wild American species. This does not mean that he is too badly handicapped. As a matter of fact, the good old Waterer hybrids are pretty fine, and now that we are learning how to grow them better, we are learning how to appreciate them more. The work of the late Dr. F. V. Coville and others, who delved into the soil and nutritional relationships of ericaceous plants, has so extended our knowledge of rhododendron growing that the limitations of our material, as compared with that of England, have been somewhat compensated. Now people are able to grow rhododendrons in Missouri, Kansas, and Texas! And azaleas have taken their place as plants par excellence for the Lower South, where the warm summers are not too good for evergreen rhododendrons.

There is another compensating factor which will tend to ease the feelings of the gardener who lives in sub-zero regions, when he reads glowing reports about the beautiful new tender rhododendrons. It is apparent that many of the newer species, although they may be "different," are of less actual garden merit than those which we already possess. There is no gainsaying the fact that many new hybrids with bright, clear colors, good size, fragrance, and charm are greatly superior to some old ones, and yet these comprise a limited number of individuals among hundreds of species which, in my opinion, are relatively worthless in the aggregate. Some have been overrated because of their novelty, and their popularity cannot possibly endure. Also, a good many of the species and hybrids, which have received awards of merit, cannot be grown in ordinary gardens, even in Britain, outside the favored spots along the Cornish or Welsh coast or in "tropical" Scotland. Such can never hope to become good commercial varieties. And it is amazing how many of the species from Central Asia bear just plain magenta-purple flowers of less than ordinary attractiveness. We already have plenty of the same hue and of better form.

Since the 1920s, however, there have been some very interesting developments in our Northeast. There have been repeated attempts to grow Chinese rhododendrons and British hybrids in New England, New York, and Philadelphia. The Arnold Arbo-

rhododendron *(above, right)* are somewhat larger than *, left)*. The Dexter flowers vary, but in the larger indi- alf inches across and have seven petal-like corolla lobes of the Dexter are fully fifty percent larger than the awba flowers.

hybrid rhododendron, the Dexter hybrids *(right)* are more upright. The flowers of the Dexter, while larger ertain plants, while in others, containing many flowers, sses are sometimes huge.

retum at Boston tried many of them as soon as they were discovered or bred, and the evergreen sorts generally failed under their uncompromising conditions. The United States Department of Agriculture raised seedlings and sent out plants for trial, and little was heard from these. But as time has gone on, growers in various places have taken pains to note signs of hardiness when it appeared, and we now realize that within these mixed populations there are occasional individuals which are hardier than their fellows. Besides this, the element of hybridity and the natural genetical instability, prevalent even within wild species throughout the genus, produces variant seedlings which show real promise. Thus it is that a few fairly hardy clones among the newer species are being isolated and will eventually enrich our list of hardy rhododendrons for the North. Vegetative propagation, which is necessary in most cases, is slow and, therefore, such material is not yet available on the market.

For the grower whose climate is not too cold, however, there is already a wealth of new material among good rhodododendrons of distinctly novel character. Of the American productions of the last two decades, suitable for growing wherever the temperature ordinarily does not go much below the zero mark, the race of large-flowered, fragrant hybrids developed on Cape Cod by the late Charles O. Dexter probably takes first place. Along with this, and perhaps more varied, are the productions of Joseph C. Gable of Stewartstown, Pennsylvania. The Dexter hybrids have been previously described in these pages. They belong, mostly, to the so-called Fortunei Series, a group of plants which have large, trumpet-shaped flowers, four inches or more in diameter, clear colors, mostly in light pink, rose, or white, sturdy growth and some fragrance. Many of them display their ancestry by producing seven corolla lobes (like petals) instead of the usual five and may also bear an indefinite number of stamens. As a race, they are very distinct from the old Catawba hybrids and, in good examples, are fully up to the standard of many of the best British hybrids. Repeated selection may isolate individuals that are still more hardy, but at present the Dexter rhododendrons may be said to endure zero weather (in most cases) and to survive wherever dwarf boxwood may be grown. The evidence indicates that those with a yellowish tinge are somewhat less hardy than the others.

I shall not attempt to describe Mr. Gable's varied productions, except to say that many of them are very beautiful and that they include forms which are both more and less hardy than the Dexter hybrids and extend to several races, including azaleas. Along with Mr. Gable, other experimenters are doing much to discover and breed hardy rhododendrons from the small, rock garden types to the large shrubs and are meeting with some degree of success. Guy G. Nearing of Ramsey, N. J., is one of these, and there are a number of others who have come into the work more recently. There is also a good deal of interest in this subject on the part of sophisticated amateurs

Experimenting along less spectacular lines are a few breeders who are attempting to improve the old hardy

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South Florida Aids in

The Tropical Rubber Program

By **H. F. Loomis**

THE natural rubber industry of the world is founded on a Brazilian jungle tree known by the scientific name of *Hevea brasiliensis*. From this tree comes the Para or Hevea rubber used in our automobile tires and in a tremendous number of other products. Although of South American origin, by far the greatest commercial development of the tree has taken place in the tropics of the Orient where the British, Dutch, and French, through selection and breeding, originated high yielding varieties and set them out in vast plantations.

About three decades ago, a few scientists and industrialists in this country recognized the seemingly remote possibility that we could be cut off from the eastern rubber supply, and they advocated the establishment of plantations nearer home, particularly in this hemisphere. The fear of losing this supply went far in inducing the attempts of Henry Ford to develop plantations in Brazil and of Harvey Firestone to establish them in Liberia. Later, while World War II threatened, the Goodyear Company began development of plantations in Panama and Costa Rica, and the U. S. Department of Agriculture entered into active cooperation with many of the tropical Latin American countries in appraising their possibilities for rubber growing and production, establishing experimental areas, providing them with trained scientific and production personnel, and also providing the best varieties or clones available from the East or from the cooperating countries themselves for breeding, selection, and expansion of plantings. This program in Latin America still is being actively advanced, for neither this country nor its cooperators wish ever again to be dependent on rubber supplies that can be stopped as they were when the Japanese overran most of the eastern producing areas.

Undoubtedly, the greatest natural threat to the development of hevea plantations in the tropics of this hemisphere is a leaf fungus that causes the so-called "South American leaf disease," a name usually shortened to "leaf-blight." So severe are the attacks of this fungus in affected areas that attempts to grow non-resistant trees in plantations usually meet with failure, before they can be brought to tapping age. The disease attacks the young leaves of the periodic flushes of growth and is especially severe in rainy or foggy weather, when humidity is continuously high for many hours. Then the affected leaves curl and fall so that with repeated attacks the trees may become partially or wholly defoliated, and the starvation thus caused eventually ends in the death of the tree.

The tree bearing these fruits is a high-yielding eastern clone and the cross is with one of the best disease-resistant Brazilian clones. The fruit bearing the tag has been hand-pollinated.

Like its host, the disease is a native of Brazil; but in the widely scattered wild hevea trees, as they occur in the jungle, its inroads are seldom severe, and often trees show little or no injury from it. It is only when trees are closely planted, as they are in nurseries or in plantation spacings, that disease attack reaches epidemic proportions, and the fungus spores are ever-present to continue infection when weather conditions permit.

At present the leaf blight has spread to nearly every area in the American tropics where rubber is grown, and probably no area there can escape it long after being planted to rubber. Exceptions to this may be the islands of Hispaniola and Puerto Rico, where the disease has not yet penetrated. Due to the prevailing winds, there is good chance that these islands will remain free from the disease, if all rubber plant material for them is passed through the established quarantine station. Thus far, leaf blight has not appeared in Africa or in the Oriental plantations, and protective measures have long been in effect to prevent its introduction there.

It was not long after the original plantation of the Ford Company was started in 1927 at Fordlandia, well up the Tapajos River of Brazil, that leaf blight struck with severity and caused the company to search for a better location. Such an area was found considerably further down the river on higher land, and the Belterra Plantation was begun in 1934. There also the blight appeared, although not as continuously severe as at Fordlandia. In 1935 leaf blight resistance was noted in some of the other species of *Hevea*, and in 1936, in order to avoid the great injury to non-resistant trees, the so-called "three component tree" was originated. Such trees were composed of a stock plant on whose roots a high-yielding clone was growing and into the trunk of which, at a height of six or seven feet, a bud of a resistant tree was inserted and allowed to grow and replace the susceptible top of the high-yielding clone. Many trees of this type were planted at Belterra and Fordlandia, although their production was both time-consuming and costly. Simultaneously, efforts were being made by selection and breeding to develop clones combining good yield with resistance. However, up to the time when the company withdrew from its plantations, only partial suc-

cess had been attained, although many clones showed high resistance. These have since been used in continuing the investigations and breeding work of our government and that of Brazil.

It has been necessary to turn to the Orient for high-yielding clones with which to combine the resistant characters available in the Brazilian selections. Unfortunately, the Oriental clones originated from seeds brought from a locality in South America where the leaf blight was unknown, and so none of them had developed any inherent resistance and cannot be used in plantations in this hemisphere without being given resistant tops by further budding.

Up to the present no entirely satisfactory clones, combining both resistance and yield, have been produced for commercial purposes, but definite progress is being made through breeding and selection in several tropical American countries as well as in Florida.

The great difficulty of doing breeding work with hevea in the American tropics is that, in nearly every locality where rubber is grown, the leaf blight threatens or is already present and attacks the high-yielding clones desired for parents. A complicated and expensive spraying program is necessary to protect the foliage of these clones from the time they are budded into seedlings, until they are five or six years old and produce flowers that can be used in cross pollinations with resistant clones.

Fortunately, however, it has been demonstrated that the hevea tree can be grown and fruited in southern Florida, where experiments with it have been in progress for many years at the U. S. Plant Introduction Garden near Coconut Grove. No attacks of the "South American leaf disease" ever have been discovered in these plantings, and it is thought that the climate is such that the disease could not long endure here, even if introduced and established during a period when moisture conditions favored its growth.

Several years before World War II, when the U. S. Department of Agriculture began entering cooperative agreements with Latin American countries for rubber plant investigations, the potential value of the Introduction Garden at Coconut Grove, as a place to maintain both high-yielding and resistant breeding clones, was recognized. From that time on, outstanding breeding clones have been sent here; many of them now are represented by mature trees, while others are in younger stages of growth.

When the first clones began to arrive, they came by air as sticks of budwood from which buds were to be taken and established in our stock plants. It was thought desirable to bud into the tops of the old trunks of our mature seedling rubber trees to take advantage of their large root systems, on the theory that flowers would be produced much more quickly than by budding into small seedlings and growing them on for six to ten years until they flowered. A few buds were established in the upper trunks of some trees, but most attempts to do so failed, and better methods were sought. It was soon found that excellent budding success could be obtained in these old trees by cutting them off about three feet above ground in the late winter or early spring, during dormancy, and budding into the new shoots they produced by summer or early fall. This practice still is followed here, and clones are brought to flowering in two to four years from the time of budding.

A quite unexpected and very helpful result of bringing these clones into the more pronounced seasonal climate of Florida is that their usual flowering habits have been considerably upset. Instead of flowering in a single brief period, as they do in tropical countries, many of the clones flower two, three or even four times during the warm months. Not only does this allow repetitions in crossing various clones, but clones that under tropical conditions flower at different times and so cannot be crossed, may here have one or two of their flowering periods coincide and so permit crosses to be made.

The breeding gardens at Coconut Grove have been arranged with the resistant clones intermixed among the high-yielding but blight-susceptible eastern ones. Thus flowers for various combinations of hand crosses are close at hand, and also open pollinations can take place between the two classes.

Hand pollinations, in increasing numbers as more clones have come into flowering, have been made at this Garden for several years. Since the leaf blight is not present in Florida, the degree of resistance in the resulting seedlings cannot be tested here, and all hand-pollinated seeds, upon ripening, are sent to the U. S. Cooperative Rubber Station, Turrialba, Costa

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This plantation of hevea trees in Brazil has almost been completely defoliated by the leaf blight. In the background, on the right, is a single tree with many leaves, indicating that it has resistance or that it put out its leaves in dry weather, when the disease is unable to attack the new leaves.

WILD FLOWERS
in The New York Botanical Garden

By **Joseph Monachino**

A GREAT variety of flowers grow spontaneously on the grounds of The New York Botanical Garden in Bronx Park. There is no complete list of these. J. K. Small, in the "Journal of The New York Botanical Garden" (1932 - 1936), mentioned about one hundred kinds of native trees and shrubs, fourteen Asiatic woody immigrants, and twenty-four species of native ferns and fern-allies. In the first volume of the Journal (1900), Elizabeth Britton discussed about a dozen species of mosses growing in the Park. Only a few of the herbaceous wild flowers have received notice (see P. Wilson in the Journal, April, May 1925). A catalogue of at least the majority of the species would be interesting. For the present, however, only several that bloom during May and June will be mentioned briefly. The botanical descriptions will be very short, as they can easily be had in the NEW BRITTON AND BROWN ILLUSTRATED FLORA OF THE NORTHEASTERN UNITED STATES AND ADJACENT CANADA and other reference books. The selection is small in comparison to the number of plants actually in bloom during these months, and the species discussed are not necessarily the showiest or most abundant. The reader who visits the Park is invited to find the wild flowers mentioned below.

Ornithogalum umbellatum is found scattered in the Park. There is a dense stand of it near the Bedford Park Boulevard entrance. The star-of-Bethlehem is a bulbous herb with linear channelled leaves and white flowers in a corymbiform raceme. This liliaceous immigrant is a rapacious invader. It may occupy a site to the exclusion of all other herbs. Above ground it forms an almost solid blanket of leaves and flowers; below the soil, a densely crowded tangle of roots and bulbs of various sizes and maturity. The bulb has thick fleshy tunics, not thin as in allium, and has no odor. Each leaf has a white median stripe above, as in crocus, but its underside is rounded and finely grooved; in crocus, the leaves have a broad flat keel beneath and the margins are inrolled. The perianth-segments are creamy white within; outwardly each has broad green irregularly bordered band. The white expanded flattened staminial filaments are contiguous so as to form a tube; those opposite the petals are broader and longer.

The generic name in Greek means bird's milk. A connection seems unlikely, but the curdy, cheesy substance which pigeons disgorge to feed their young is called pigeon's milk. This term is also applied in another sense; on the first of April children are sent on a fool's or sleeveless errand — to buy pigeon's milk. One can see small boys and girls in April collecting huge bouquets of ornithogalum, and one may wonder whether these children know Greek, and are obtaining bird's milk, in lieu of the pigeon's milk of their fool's errand.

Smilacina racemosa has a thick knotty rhizome. The stem is often finely ruby-purple streaked below; it is zig-zag above. The lower leaves are narrowed into a broad, often purplish, petiole which embraces the stem for the greater circumference. The inflorescence of the false solomon's-seal is a terminal racemose panicle. The filaments, which resemble the tepals (petals and sepals very little differentiated) in color and shape, add to the star-like appearance of the white flowers; the ovary is white; the anthers are pale yellow.

Maianthemum canadense, although a member of the Lily Family, has only four tepals and four stamens. The individual flowers resemble those of smilacina. The wild lily-of-the-valley has extensively creeping filiform rhizomes; unlike smilacina, it forms colonies, appearing as sterile single heart-shaped leaves intermixed with the flowering stems.

Sisyrinchium graminoides is found growing in grassy places north of the Museum Building. The species is described under the name *S. angustifolium* in Fernald's "Eight Edition Gray." The leaves are grass-like but equitant, resembling in miniature the ensiform leaves of the iris and gladiolus. The stem is broadly winged so to be thin edged and flattened, almost foliar in character. The inside of the perianth is deeper violet than the outside and is yellow-eyed at the center; the segments are aristulate at the apex. The filaments are connate, pilose at the base with slender capitate hairs. The corolla and the attached filaments fall off easily, revealing the spherical green ovary.

The present blue-eyed grass was named in 1896 by Eugene Bicknell, one of the most astute amateur local botanists, to whom we owe much of our understanding of the sisyrinchium species of the eastern United States. We have abundant authenticated specimens to know what *S. graminoides* is. According to Fernald, the earlier and thus the correct name for the species is *S. angustifolium* described by Philip Miller in 1768; Fernald elaborated his arguments in RHODORA, vol. 48, pp. 152-159. In the NEW ILLUSTRATED FLORA the name *S. angustifolium* is applied to a different plant, and in other works there is still further disagreement in concepts. The solution of nomenclatural tangles of this kind hinges on what the botanists fondly call "the type," in this case the type of Miller's species.

Lychnis alba grows sporadically on the grounds of the Park. It is a hairy dioecious weed. Its inflorescence is glandular pilose. The petals of the evening-lychnis are bilobed; their claw is crowned by an errose appendage.

Brassica nigra is likewise sporadic. Its stem is bristly hairy. The leaves are lobed and irregularly sinuate-dentate. The tetramerous flowers have yellow petals with greenish veins; there are four peg-like green glands alternating with the stamens. In bud, the claws of the petals and the filaments are pressed down and crumpled. A preparation of the seeds of black mustard is employed externally as a rubefacient and counter-irritant.

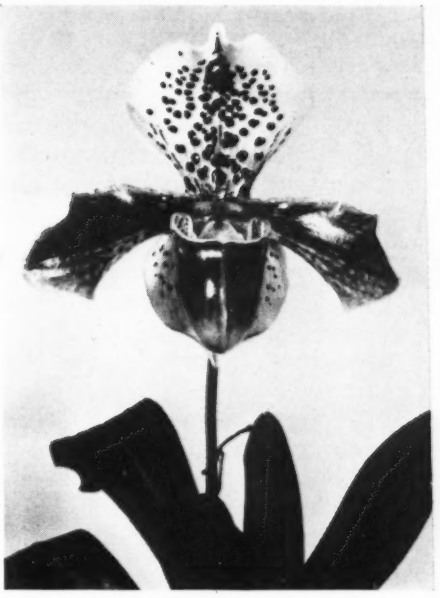
Achillea Millefolium has a ridged, more or less arachnoid stem and feathery leaves pinnately dissected into fine acute segments. The yarrow is rhizomatous and the basal leaves carpet the ground in early spring. The pin-

(Continued on page 90)

Cypripedium venustum

Start Your Collection with CYPRIPEDIUMS

By **Margaret Ilgenfritz**



Cypripedium Florence Spencer x Ethel M. du Boulay

YOUR first glance at a "Cyp" in the florist's window may be only casual, with the mental reservation that it is "exotic" or "unusual"; but if you wear one, you will wear another and, if you're like me, you'll find yourself growing them. *Cypripedium, Paphiopedilum,* lady-slippers or, as they are usually called, "Cyps," are among the orchids easiest to grow. They are particularly suited to amateurs for this reason, and because they will grow in a limited space and have long lasting blooms in a wide range of color. If you can accommodate only one group of orchids, by all means it should be "Cyps."

The native lady-slippers of North America usually grow in moist locations, where civilization has not encroached too far. They are deciduous and apparently do not take kindly to transplanting. Few people have success in transplanting them into their gardens, and they almost never do well in greenhouses. Since most states frown on their removal, it is recommended that you purchase these plants from one of the several nurseries offering them. The better-known native species are *C. candidum, C. Calceolus* var. *pubescens,* and *C. acaule,* but there are about thirty other named species.

Cypripedium flowers are usually produced singly. They come in bold colors, from pure white through yellow, green, red, and purple. Most have wart-like darker spots on the dorsal sepal, which is the most attractive part of the flower. It seems to be standing guard above the pouch or "slipper." Almost all the blooms are striped. They have a heavy wax-like texture and often remain in excellent condition on the plant from six weeks to two or three months.

Cypripediums can be divided into two important types: the warm-growing, mottled-leaved species and hybrids, and the cool-growing, green-leaved species and hybrids. Most people confine their efforts to the cool-growing type, because they can easily be grown with other plants.

The "cool" plants are usually grown at a night temperature of 55°; the daytime temperature usually does not go over 75°. Of course, if the plants are grown in a greenhouse, the sun may increase the day temperature somewhat, at which time it will be necessary to increase the humidity. Night temperature for the "warm" plants, however, should be 60-65°, and day temperature can be up to 80°.

All Cypripedium species and hybrids require some shading most of the year. In this part of the country, Monroe, Michigan, I remove almost all the shade from the glass about the fifteenth of November and begin to put it on again about the first of February. A thin coat of shading is usually all that is required, except where more may be necessary to keep greenhouse temperatures down during the warmest weather.

In a home these plants may be grown in a west or north window or in a Wardian case. Humidity is easier to maintain in the case, but plants raised over water in a bay-window do very well, too.

Cypripediums are grown in a variety of potting mixtures. Some people prefer straight light brown osmunda pulled apart and not too tightly packed. Others prefer one-third osmunda, one-third sphagnum, and one-third leafmold. I use two-thirds osmunda fibre pulled apart and one-third sphagnum moss. "Cyps" need to be potted firmly but not too tightly. Good drainage is essential. The potting medium should be damp but *not wet.* Spraying of the foliage once or twice a day on bright days is beneficial, except when the plants are approaching blooming time. If water stands in the leaf axils then, the buds may rot.

It is usually sufficient to water in the pot twice a week, although in the summer it may be necessary to water more often. The rhizome of the plant should be not more than one-half inch below the surface of the potting medium, which should be level with the rim of the pot. Adequate drainage must be furnished in the form of broken crock, usually two inches or so in the bottom of the pot.

A weak infusion of manure once a month is beneficial, after new growth has started. Commercial fertilizers have been found helpful too, although about half of the recommended strength for other plants is sufficient for cypripediums.

Propagation of cypripediums is usually by division after the plant has bloomed. There must be at least three growths to each division, so that the plant will be strong enough to continue immediately to add new growth. Care must be used in dividing old plants, because the dormant eyes are small, close together, and easily damaged. The roots and rhizome ought to be washed clean before attempting to divide a plant; otherwise it is difficult to tell where to cut through the rhizome.

If you live in a warm part of the country, you may find it a good idea to take your cypripedium plants outdoors in the summertime, either to a lath-house or under the shade of a tree. The plants respond wonderfully to this treatment from June to September. Watering will have to be done more frequently if the plants are outside, because the pots dry out more quickly.

Countless numbers of beautiful, large hybrids have been developed during the last fifty years, but plants of blooming size of most of them are quite expensive. The following list is suggested for beginning orchid growers, either in their homes or in their greenhouses. Of course, there are many others, the names of which may be obtained from professional growers.

Cypripedium callosum has large variable flowers, the dorsal sepal of which is white, shaded green at the base, striped and often flushed with crimson; the petals are pale green, the lip brown-purple. *C. callosum,* a native of Siam, blooms in spring.

Cypripedium Charlesworthii is of dwarf habit. The dorsal sepal is large, broad, and flat, suffused and veined with rose; the petals and somewhat small pouch are a glossy yellow-brown. A native of Burma, *C. Charlesworthii* blooms in late summer.

Cypripedium Fairreanum is also of dwarf habit. The flowers are rather small, but very pretty. The dorsal sepal is white, yellowish-green at base, veined with purple; the lip is green flushed with red and veined with purple. This native of Assam flowers in winter.

Cypripedium hirsutissimum bears large flowers, the upper sepal is densely spotted with purple, margined with green; the petals have green markings with purple at base; the lip is dull green and brownish-purple. A native of Assam and India, this cypripedium is spring-blooming.

Cypripedium insigne var. *Harefield Hall* has large, bold flowers; the dorsal sepal pale yellow-green, spotted with chocolate and margined with white. The pouch and petals are yellow-green. Another native of Assam, it also flowers in winter.

Cypripedium Lawrenceanum has large flowers. The bold dorsal sepal is white with purple-red stripes, green at the base; the petals horizontal, green with purple shading, black-warted; the lip dull purple tinted with brown. This cypripedium, which comes from Borneo, blooms in summer.

Cypripedium venustum is a very lovely mottled-leaf species with medium-sized flowers. The dorsal sepal is white with green stripes; the petals are rose-tipped with chocolate-brown warts near the center; the pouch is yellow-veined with green. A native of north India. *C. venustum* produces its flowers in spring.

Cypripedium Maudiae, a very popular hybrid, produces large white flowers with green stripes. It has a long-blooming season.

With these few plants, you may enjoy many hours of real pleasure. There is a real thrill in owning and successfully flowering a group of cypripediums — and you will be the envy of all your friends.

WILD FLOWERS **(from page 88)**

natifid lobules at each side of the midrib diminish in size towards the base of the blade; they are not in a flat plane but inclined, or with the margins almost in a vertical position; their sharp ultimate segments are bristle-tipped. The inflorescence is in flattish-topped compound corymbs; the ovoid-cylindric involucres of the small flowerheads have dry scarious-margined pale phyllaries imbricated in many ranks. The flowers are sometimes strikingly rose-colored (forma *rosea*). In its world distribution, the species is polymorphous. The dried herb when in bloom furnishes *herba et flores Millefolii,* a characteristically aromatic bitter used as a diaphoretic (to increase insensible perspiration) and an emmenagogue.

RUBBER PROGRAM **(from page 87)**

Rica, where the seedlings are exposed to natural and artificial infection and their value appraised. If disease resistance is low, the seedlings are immediately discarded, but those that show high resistance are grown on for further study and eventual yield tests.

Flowering records are kept throughout the season in all breeding gardens, so that the possible parentage of open-pollinated fruits may be determined with some degree of accuracy. From all eastern clones the seeds suspected of having a resistant parent are harvested, labelled with their known female parent and probable male parent names, and then sent by air to Turrialba for planting and test. There any seedlings that show leaf blight resistance are recognized as hybrids and are saved or discarded, depending on the degree of resistance shown. Seedlings that show no resistance are considered to have susceptible eastern parents only and so are of no value in the breeding work.

In addition to its importance in the hevea breeding program, the U. S. Plant Introduction Garden also is becoming of further value in the plantation industry of the world. It has been made a quarantine station for rubber clones, especially the resistant ones desired by tropical countries of both hemispheres that do not yet have the leaf blight and wish to protect themselves against its possible invasion by developing high-yielding clones that will withstand it. Here, budwood is being grown, free from leaf blight and other diseases, for shipment to countries that could not safely receive the clones from other foreign countries. Thus exchanges are in progress that will benefit the entire rubber industry.

RHODODENDRONS **(from page 85)**

American species by hybridizing with some of the new species and clones. This appears more promising than selection, since none of the exotic sorts are quite tough enough for really subzero climates. This work is slow, for the first-generation crop is usually only half-hardy, but it is hoped, in time, that some of the glorious bright colors of the newer types can be successfully transferred to the old American "iron-clads."

For the Younger Generation of Gardeners

SUMMER COLLECTIONS

By **Elizabeth A. Pullar**

How would you like to make a collection this summer? A collection of what? Well, it could be just about anything. There are so many nice things to collect and learn about. Let us talk them over and then decide what appeals to you most.

Have you ever thought of collecting tree leaves? Just think how many different kinds of trees there are in the world. Wouldn't it be fun to see how many kinds of leaves you can collect during the summer? You will need a large notebook for this. Select a perfect leaf from each tree and press it dry between sheets of clean paper. You will want to weigh it down, while drying with one or two heavy books. In about a week, when the leaf is dry, you can mount it on a page of your notebook. Thin strips of Scotch tape will hold the leaf in place. Use a separate page for each leaf. The next step is to label the leaf. If you know the name of the tree, write it neatly under the leaf. If you don't know the name of the tree, you will have to ask someone or try to identify it from a tree book. Your library should have some good books on trees. In this way you will learn the names of many new trees. At the end of summer you will have a neat notebook called "Tree Leaves." In it you will probably have at least twenty-five different kinds of leaves. That would be a nice collection to show your teacher next fall.

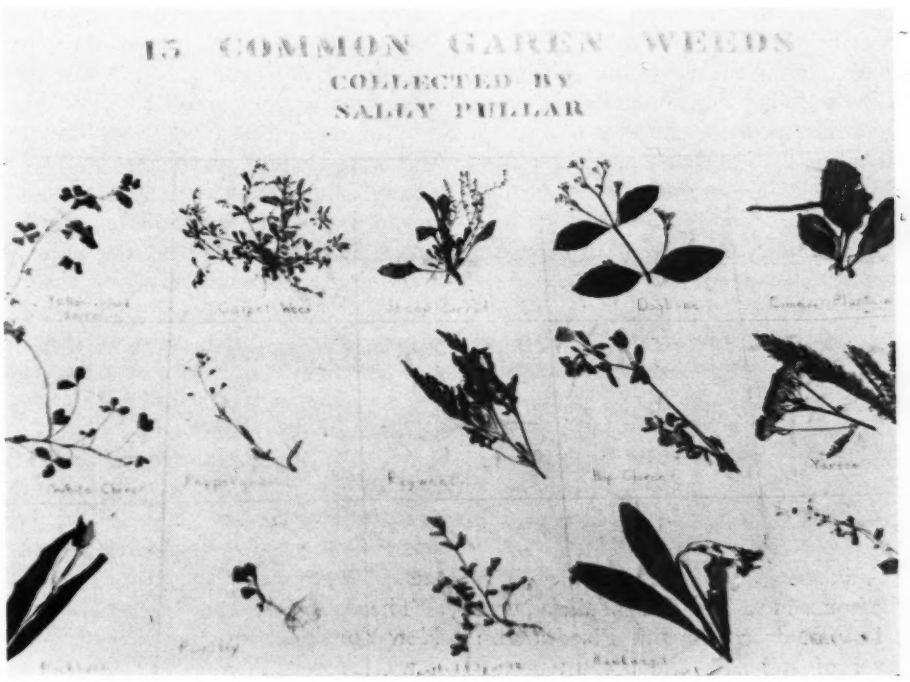
Another idea is to collect wild flowers. Everywhere you go there is some wild flower blooming in the grass, at the side of the road, in the fields or woods. Because there are so many wild flowers, this collection is easy to make. See how many different ones you can find. You will want to press them like the tree leaves and, when they are dry, mount them in a notebook called "Wild Flowers." At the end of summer, you should have at least forty wild flowers. If you don't know the names of some of them, look them up in a book of wild flowers. Then next summer when you find these same flowers, you will know their names and it will be like meeting old friends!

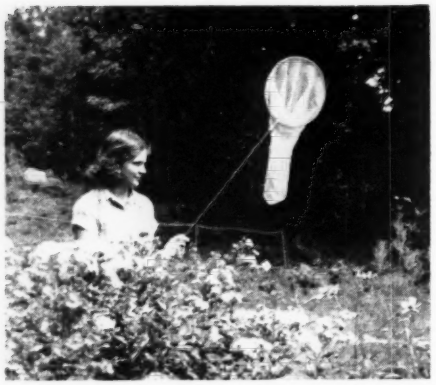
If your mother or father has a flower garden, you may want to make a collection of "Garden Flowers." You will need an extra large notebook for this collection, for some of the garden flowers, such as phlox and zinnias, are pretty big. It is fun to learn the names of garden flowers, because you see them in other people's gardens, too. If you decide to make this collection, ask your mother to buy different kinds of seeds next year. Then you can add these flowers to your notebook, and you will have a great many kinds of garden flowers in your collection.

If you live near a country road, a fern collection would be interesting to make. Perhaps you never realized how many different kinds of ferns grow near you. Press them and keep them, too, in a pretty notebook called "Native Ferns." See if you can find the cinnamon fern, the Christmas fern, the interrupted fern, the hay-scented fern, and the maidenhair fern. When you find them, you will see why these names have been given to them. A small fern that grows on rocks has a queer name — the polypody fern! If you are lucky, you may find a walking fern to add to your collection. Did you know that ferns can walk? See what other ferns you can find. You will need a fern book to identify them.

Some children like to make weed collections. This is an easy one, for there are always plenty of weeds around. Many people know the plants are weeds, but they don't know the names of them. If you make a weed collection, you will be learning their names and then you can teach them to others. Did you know that there are books written about just weeds? Suppose you collect fifteen common weeds that you find on the lawn or in the garden. Press and fasten them in a notebook, naming each one. This will be your "Weed Collection." You may think some of the weed names are very funny, such as carpet weed, peppergrass, and hawk weed.

One of the nicest of all to make is a "Butterfly Collection." You will need more equipment for this hobby. First, you will have to have a butterfly net. This is used to catch the butterflies. They fly away quickly, so you will have to be fast with your net. Flower gardens always have many butterflies and you can find them in the fields,





Sally Pullar is engaged in catching butterflies for her collection.

too. Their wings are so pretty. If you have a butterfly book, you will soon learn the names of perhaps ten common butterflies.

After you catch the butterfly in a net, you will want to put it in a "killing" jar. Your mother or some teacher will help you make this jar. Then you will learn to "spread" and mount the butterfly. A box filled with ten beautiful butterflies is a splendid collection.

After you have learned to make a "Butterfly Collection," you may want to start an "Insect Collection." You will find so many interesting insects in the garden. Some of them are very large, like the stag-horned beetle. Then there are pretty ones like the ladybug or a huge bumblebee. One of the strangest of all insects is the walking-stick. This is hard to see unless it is moving, for it looks just like a little twig! Another unusual insect is the praying mantis. This one, too, is hard to see among the leaves, for it is green like the foliage. If you are quick with your net, you may be able to catch a dragon-fly, or perhaps, at night, a fire-fly. Insects are mounted in a box like butterflies. You will be surprised how many different kinds of insects you can find in one summer.

One little girl thought there was just one kind of moss. Then last summer she began looking and found sixteen different kinds! From the library she borrowed a book on mosses, and her mother helped her to learn the names of the ones she had found. A good place to look for moss is in the woods or along a shady road bank.

You can gather moss and keep it in the house for a long time. Take a large cake pan or cookie tin. Place a thin layer of soil over the bottom of the pan and keep it moist. As you find a new kind of moss that looks different from the rest, gather a little clump of it and push it into the damp soil in the pan. Before long the soil will be covered with pieces of moss, each one different. Moss is easy to gather with your fingers, for it has no roots. You will like your little moss garden. Keep it well watered and the mosses will grow green and thrifty in the pan. Some people like to put a mirror between two pieces of moss to make it look like a little pool of water.

Now I wonder which one of these collections you will choose to make.

SCHOOL GARDEN ASSOCIATION OF NEW YORK

By **Romaine F. Button**

So far as is known, Henry L. Clapp, Head Master of the George Putnam School in Roxbury, Mass., established the first school garden in America in 1891. It started as a wild flower garden; the culture of vegetables was added a few years later.

In 1901, the first school garden in New York City was established as the De Witt Clinton Park School Garden at 56th Street and 11th Avenue. Mrs. Henry Parsons started it in a vacant city-owned lot

The first garden area to be set aside in a school yard was at Public School No. 52, Manhattan, where a bronze plaque on a boulder commemorates the event which occurred in 1905.

Van Evrie Kilpatrick, a teacher in this public school, was the guiding force behind the establishment of school gardens and was responsible for gathering together, in 1908, a group of like-minded citizens and educators into the School Garden Association of New York. By 1921, this association had seven thousand members, largely teachers, and had sponsored school gardens in seventy-seven schools.

Mr. Kilpatrick's motto was "A Garden for Every Child," and he encouraged the growing of plants, especially the easy-to-grow paper-white narcissus, in every classroom in the city.

The School Garden Association of New York publishes the "Nature Garden Guide" and distributes nine thousand copies to teacher members four times a year. Each issue is devoted to a special seasonal activity, such as growing bulbs in school, nature rooms and corners, and school garden planning and maintenance.

Through arrangements with a florist, plants may be ordered for classrooms and offices at very reasonable prices. Materials for experiments in nature rooms and corners are distributed at cost.

Certificates, pins, and medals are also available at cost. These are used by teachers as incentives and rewards to pupils for achievements in gardening or nature activities. One hundred and fifty medals and six hundred certificates were donated as prizes for pupils participating in the 1952 summer garden activities sponsored by the Elementary Science Office of the Board of Education.

The garden program first received financial support from the Board of Education in 1918, and since then, has been an increasingly important activity.

The School Garden Association maintains an office at 121 East 51st Street, New York 22, N. Y., with a full-time clerk and a teacher assigned to help school personnel with garden and nature problems. Membership costs 25c to teachers in school groups or $1.00 to individuals. All members receive publications and may attend regular meetings.

PLANTS GROW BETTER (from page 82)

in a clean container. Most states provide testing service for their own people, often free of cost, but sometimes a small fee is charged. The good gardener needs to have his soil tested from time to time.

Too Much of a Good Thing

Most gardeners err on the side of putting on too much, rather than too little — too much lime, too much fertilizer, too much water, too much insecticide, too much fungicide, and too much of this and that. A little lime, a little fertilizer, a liberal application of well-rotted compost, and a great deal of careful labor make for a good garden. There is an old saying among live-stock men that "the eye of the master fatteneth his cattle." The eye of the master gardener tells him what to do and when to do it.

BOOK REVIEWS

GREEN TREASURY. Edwin Way Teale (Selected and edited by). 612 pages, illustrated by Michael B. Bevans; indexed. Dodd, Mead & Co., New York. 1952. $5.

A more appropriate name could not have been found for this assemblage of quotations from eighty-seven authors, whose writings have appeared over a period of some twenty-two centuries. The selections *are* a real treasury of recordings, brought together at the expense of thousands of hours of reading on the part of Edwin Way Teale and placed under such chapter headings as: "The Lands," "The Waters," "The Sky," "The Life of the Earth: Plants," "The Life of the Earth: Animals," or "The Life of the Earth: Man and Nature."

In his introduction Mr. Teal makes this comment: "man has been setting down the mysteries observed, the feelings engendered, the thoughts evoked by his contact with the many-faceted nature. Nature the friend, nature the enemy, nature the enigma, all have been reflected in the written word." From these observations that have been recorded through the centuries, Mr. Teal has chosen passages from the writings of Aristotle through to our present time, including quotations from Marco Polo, Darwin, Emerson, Whitman, Muir, Burroughs, Faber, Poe, Steinbeck, Peterson, Platt, Beebe, Carson, and seventy-three other noted writers.

Beside placing the selections under appropriate chapter headings, Mr. Teale has added, in his own delightful style, comments which may have to do with the life of the author, the time the passage was written, or possibly *why* it was written.

GREEN TREASURY, which contains inspirationally-beautiful quotations may also give a greater respect for the modern writer's understanding and appreciation of the "many-faceted nature" than was afforded to some of the early writers. Thank you, Mr. Teal, for another fine book!

FARIDA A. WILEY
American Museum of Natural History

THE MIGHTY LEAF. Jerome E. Brooks. 361 pages, indexed. Little, Brown & Co., Boston, Mass. 1952. $5.

This is a fascinating history of man's use of tobacco from the discovery of America to the cigarette age. The author is eminently qualified, having previously published four volumes from his study of the Arent's collection in the New York Public Library, the world's most complete collection of tobacco literature.

The reader is surprised to learn in the first chapter that every form in which tobacco has been used — cigar, cigarette, pipe, snuff or quid — was used, at least in prototype, by the natives of America before Columbus. Each one has had its grand heyday and decline in the centuries that followed — first the pipe in the sixteenth and seventeenth century, snuff in the eighteenth. The nineteenth was the century of the cigar, and the all-conquering cigarette has taken over the show in the twentieth. The "chaw" has had two periods of popularity, an earlier one in the seventeenth century and an intense revival during the middle years of the nineteenth.

The author has the happy faculty of presenting authentic basic history in an entertaining and often humorous vein that makes the whole story read like a novel. It is also the most complete and authentic history of tobacco published in any language.

P. J. ANDERSON
Tobacco Research Chief, Retired
Conn. Agr. Exp. Station

POISONOUS PLANTS OF THE UNITED STATES. Walter Conrad Muenscher. 277 pages, illustrated indexed. Macmillan, New York. Revised edition. 1951. $4.

A compilation of the widely scattered poisonous plants of the United States has been brought together in a practical way by Dr. Muenscher in his revised edition of POISONOUS PLANTS OF THE UNITED STATES. The work includes some four hundred species of higher plants.

Heretofore poisonous plants, although of general interest and great economic importance, have usually been dealt with rather superficially and in separate pamphlets and periodicals. All too often these plants have been described only by their common names, with scanty details of their appearance or habitat and with meagre reference to their harmful components. Not since Pammel's MANUAL OF POISONOUS PLANTS (1911) has a well-prepared treatment been published, until the work was undertaken by this author.

In Dr. Muenscher's handy volume, the poisonous plants are arranged according to plant families. A complete description of each plant is given, its habitat, its distribution, its poisonous principles, and the symptoms caused by the poison. Attention is given, in each instance, as to whether the plant is injurious to human beings or animals. The author further facilitates the usefulness of the book by indicating if the injury may be internal, external, or mechanical, and how serious any affliction may prove to be. The author has emphasized more fully than in the previous edition the plants causing photosensitization, seleniferous plants, and poisoning caused by the storage of potassium nitrate in some plants.

The book deals with poisonous plants in intimate relationship to daily life and to industry. For instance, plants are listed which change the flavor of milk and milk products, a consideration of great importance to dairymen. Toxic substances of numerous ornamentals which might be in anyone's garden or grounds are described. In a number of ways the author relates these harmful plants to the lives of the readers in an exceedingly practical way.

Following the general plan of the first edition, there is a complete list of plants with their common and botanical names and the part of the plant yielding the poison. Such an arrangement serves as sort of index for the reader, particularly anyone with a biological background.

The botanical method of classification is Englerian. This is the classification in wide general use and in most herberia. The nomenclature is correct. The descriptions are not involved or difficult. The index is complete and easy to follow. The volume has many illustrations. They are large and sufficiently detailed to make them useful, and they add much to the attractiveness of the book as well.

The book should be valuable to the economic botanist and the horticulturist, to a pharmacist or a naturalist, to a veterinarian, farmer or gardener; in short, anyone interested in poisonous plants and their properties.

JESSIE G. FISKE, *Chairman*
Dept. of Botany & Zoology
N. J. College for Women

NATURAL COMMUNITIES. Lee R. Dice. 547 pages, illustrated, indexed. University of Michigan Press, Ann Arbor. 1952. $5.50.

There has long been a need for an elementary book on general ecology, which would explain simply and clearly the basic principles which underlie natural communities of plants and animals. Dr. Dice has supplied that need. His book is suitable for under-graduate and beginning students of ecology and also for the layman who has recently become aware of this science and its relation to human welfare through the applied field of ecology, commonly known as conservation.

This text points out the basic forces at work in nature with special reference to the dynamics which control biotic communities. Emphasis is given to universal processes operating in all communities and populations. No one is treated exclusively or in detail. Coverage is extensive rather than intensive. Technical terms are reduced to a minimum and those that are employed are defined as used in the book. Concepts and principles are illustrated with concrete examples but without unnecessary detail. Professional ecologists will disagree with some of the controversial issues, but these are largely confined to the last few chapters.

The author drew upon a wide selection of published literature in the field. There are approximately one thousand references cited. Suggested readings are given at the end of each of the twenty-three chapters which are devoted to the following: the nature and methods of community ecology; the measurement and fluctuations of populations; the reciprocal relations of communities and environmental factors; the interrelationships and behavior of species; the succession, classification, evolution, and philosophy of communities.

RALPH W. DEXTER
Dept. of Biology
Kent State University

THE TREES OF LONG ISLAND. George H. Peters. 63 pages, illustrated. The Long Island Horticultural Society, L. I. Agr. & Tech. Inst., Farmingdale. 1952. $1.

The time distance between Brooklyn Botanic Garden and Gardiner's Island may have shrunk considerably since the 1922 tree census of Norman Taylor, but now, as then, the mileage between may be the least time-consuming factor. The search for, together with the accessibility to, former record-holders are likely to place equal demands upon time and patience as in years gone by, added to which reports of new aspirants for admission to the "Hall of Fame" have to be checked on their qualification for inclusion.

This has been the task of George Peters, a labor of love and a work well done, as evidenced by his BIG TREES OF LONG ISLAND. Having a slight knowledge of the personal labors involved, I can testify to the "singleness of purpose" with which he, upon every favorable occasion, made the systematic search and coverage for, and of worthwhile trees. His work speaks for itself, and in adding much to our knowledge of our own heritage of trees, he has indirectly empha-

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THE NEW YORK BOTANICAL GARDEN

Bronx Park, New York 58, N. Y.

sized how much we are to blame for the losses sustained in trees which, together with water, constitute our greatest natural asset.

We who live here recognize that the woodlands are of secondary growth, confirmed by his description of the logging operations of a century ago. This is on a parallel with the commercial exploitation of the wooded areas of the North and West, but one wonders whether the joint destruction of our later woodlands by agriculture and fire are not even more harmful to the beauty and climate of this Island. As we see hundreds of acres being burned or bulldozed for crops or building developments, the thought arises that a crusade for the preservation and care of all remaining trees should be the duty of every individual, every governing body, or local power, to perpetuate some of the natural beauty which is being so ruthlessly destroyed.

As Mr. Peters has so well pointed out, the original nurseries supplemented the natural wealth by their worthwhile introductions, afterwards acquired by the many estates for which Long Island was famous. But alas, these, too, have in many cases been succeeded by huge building developments of homes and shopping centers and the necessary means of access.

Perhaps if every lot owner would plant or preserve one good tree, those who follow George Peters in his good work may still find BIG TREES ON LONG ISLAND.

FREDERICK W. SPARKS
Bayard Cutting Arboretum
Oakdale, L. I.

FLOWER ARRANGEMENT FOR CHURCHES. Adelaide B. Wilson. 192 pages, black and white photography by Miriam Phair Rhine; color by Roche; indexed. M. Barrows, New York. 1952. $4.00.

Adelaide B. Wilson's book very effectively covers most of the important points on flower arrangement for churches, such as church architecture, the altar, and the cross, and discusses the floral traditions of different denominations. A very worthwhile chapter is concerned with altar arrangements for different occasions in these denominations. Her treatment of floral decorations touches upon the usual elements of design in all good arrangements.

There are several pages listing plant material appropriate to church use and a discussion of the symbolism of certain fruits. An unusual feature is the matter of the choice of flowers to be used under a stained glass window.

A problem familiar to many church flower arrangers, namely, how to handle various hard-to-combine flowers sent by the florist or well-meaning friends, is very cleverly solved by the experienced author.

There is an interesting section on the use of wild flowers in country and suburban churches, where flowers like "Queen Anne's Lace" and "Tiger lilies" and other roadside beauties are so near at hand and so plentiful. Mrs. Wilson wisely notes that it is not necessarily the rare or expensive flowers that are always most desirable. Simple wild flowers may be equally exquisite against an appropriate background.

The book is beautifully illustrated with black and white photographs and a number of excellent color plates of altars and floral decorations. These flower arrangements are skillfully analyzed by the author.

No doubt this useful book will prove a valuable guide for many a church flower committee.

LILLAN KEARFOTT
Mamaroneck, N. Y.

BOTANY. Carl L. Wilson. 483 pages, with line drawings by Hannah T. Croasdale; indexed. Dryden Press, New York. 1952. $6.10.

Fifteen chapters are devoted to structure, physiology, and reproduction followed by one each on ecology, genetics, evolution, and taxonomy, and by eleven on a comprehensive survey of the plant kingdom. Professor Wilson has been unusually successful in providing an interesting and satisfying introduction to botany in the first five chapters under the titles: "The science of botany," "Plants, their nature and use," "The plant plan and its modifications," "The cell as the basis of plant life," and "The matter and mechanics of cells." Ecology, too often neglected in the introductory course, receives deserved attention. The community is presented as the fundamental ecological unit. Communities through the influence of climatic, edaphic, and biotic factors are pictured as becoming arranged in four vegetative patterns: tundra, forest, grassland, and desert.

The significance of plants to society is skillfully emphasized and the prediction is made that ". . . energy for all living things will probably always be supplied by green plants." The importance of bacteria and other fungi in industrial processes, in the preparation of food, as the cause of disease, and as the producers of antibiotics is more fully developed than in most introductory texts. Fossil plants have received excellent coverage, and their bearing upon evolutionary theory has been stressed.

This is an accurate and substantial text which with interest and graphic display sets forth the ever-widening field of general botany. Certainly, the needs of both the general student and of those majoring in botany have been admirably met.

The chief criticism of Professor Wilson's text, in the opinion of this reviewer, is that it previews too much material which the student should meet for the first time in the laboratory. This may have a tendency to reduce the laboratory period to an exercise in verification of what has already been illustrated in great detail. Laboratory exercises designed wtih the experimental approach in mind may be the answer to this objection. Also, from the standpoint of subject matter, little remains for the lecture: However, the role of the lecture in the introductory course may well be restudied. The increasing excellence of modern texts may make it desirable to abandon the lecture method entirely and supplement it with an additional laboratory period and an hour devoted to discussion and questions. There is much to indicate that present-day students lack a real appreciation of subject matter in botany. Extra laboratory time and discussion based upon what the student has observed for himself and supplemented with text material should go far in correcting this condition.

The illustrations are abundant and have been selected with discrimination. Miss Croasdale is to be congratulated on the excellence of the line drawings. They are a forthright teaching aid.

MARION JOHNSON
Dept. of Botany
Rutgers University

THE YEASTS. A Taxonomic Study. J. Lodder and N. W. J. Kreger-Van Rij. 713 pages, illustrated, indexed. Interscience Publishers, New York. 1952. $19.80.

The Yeast Division of the *Centraalbureau voor Schimmelcultures* at the Technical University in Delft, Holland, has given attention during the last twenty years to the classification of yeast. Three monographs have appeared: "Die sporogenen Hefen" in 1931, "Die anaskosporogenen Hefen, I Halfte," in 1934 and "Die anaskosporogenen Hefen, II Halfte," in 1942. These publications covered the yeast species and strains then present in the collection. The present volume contains the essential elements of the earlier volumes revised in accordance with the present state of knowledge and condensed to a single volume.

A revision was highly necessary, due to the rapid development of yeast genetics based on the fundamental investigations of Winge and his school, and the contributions made by the Lindegrens and their collaborators.

The authors faced a number of difficult problems. The yeasts constitute a group of microorganisms neither well defined nor homogeneous, and the boundaries are subject to arbitrary decisions. Botanists began describing and differentiating plants on the basis of taxonomic features. More recently physiological properties and chemical reactions have been employed. The difficulty of unifying these two concepts as a basis for classification is a problem which the authors have tried to meet.

Many will believe that chemical reactions offer a more scientific and satisfactory approach than purely taxonomic features. One of the difficulties which has not been surmounted is in distinguishing one organism from another as a result of morphological variations arising from the lack of stable environmental conditions, such as variation in temperature, humidity, nutrient concentration, composition of the media, oxygen exposure, concentration of CO_2, acidity, previous nutrition of the organism or the spores, and the type of container in which the organism is grown. These factors are further complicated by the heterothallism of some species and strains. Great progress has been made in this area, but there is need for further confirmation of some of the results, and further experimental data are necessary.

The authors have given a general classification of the yeasts on page 51. The yeasts are divided into three groups: a. the ascosporogenous yeasts, i.e., the yeasts forming asci, and ascospores. They are grouped in the family of the Endomycetaceae. b. The yeasts forming ballistospores which arise on sterigmata and are ejaculated by a drop-excretion mechanism. They are grouped in the family of the Sporobolomycetaceae.

c. The asporogenous yeasts which form neither ascospores nor ballistospores. They are grouped in the family of the Cryptococcaceae.

The morphological properties investigated were: 1. Characteristics of the vegetative reproduction; 2. Shape and size of the cells; 3. Ascospore formation; 4. Ballistospore formation; 5. Shape of the ascospores and of the ballistospores; 6. Macromorphological characteristics of the cultures.

The following physiological properties were investigated for each organism: 1. Pellicle formation on liquid media; 2. Fermentation; 3. Sugar assimilation. The following sugars were used: glucose, galactose, saccharose, maltose, lactose and raffinose. Ethanol was also employed. Trehalose was not employed; investigation covering this sugar would be of interest; 4. Assimilation of nitrate; 5. Ethanol as sole source of carbon; 6. Splitting of arbutin; 7. Production of carotenoid pigments; 8. Production of starch-like compounds; 9. Production of esters; 10. Reaction in litmus milk; 11. Splitting of fat; 12. Production of acid.

This is a very effective approach to the study of physiological responses, but it is believed that this is only a beginning. Many properties remain to be investigated. It is believed that the rate of fermentation of the sugars and the rate of growth should be measured, inasmuch as these are often very definite characteristics of organisms. The effect of certain amino acids and derivatives of nucleic acid have not been widely investigated. The use of vitamins in combination may not be satisfactory in view of the inhibiting influence of some of the vitamins and the enhancement effected by certain combinations of vitamins. Until more is known about the physiological response to aminoacids and the vitamins under various environmental conditions, such as in the presence of mineral salts with various sugars and at varying levels, definite conclusions may not be possible.

The suggestion of Wickerham and Burton, and Wickerham that a wider scale of carbon compounds be employed is one that needs following up. The investigations of Schultz and Pomper covering the assimilation of amino acids by various yeast strains should be carried further, as this approach seems to be promising. More recently Schultz and McManus proposed that the assimilation of sulphur compounds should be considered as an extension of the present methods for the examination and differentiation of yeast strains. Furtlier use of enzyme reactions offers possibilities. The authors have not given consideration to these methods in their studies but have mentioned them in their discussion.

As an example of the great assistance this work will be to workers in the field, the reorganization of the data and literature on *Candida albicans* may be cited. Over two pages are required to list the synonyms for this organism. The systematic discussion of the various species of *Saccharomyces cerevisiae* (Hansen) is very comprehensive, and the treatment is effective. Simplification and more accurate descriptions have been developed. The confusion will not be entirely eliminated, for classification is not as definite as a mathematical science. However, a great advance has been made in classification and in eliminating certain recorded observations.

This book is an important and helpful contribution in the field of microbiology. Workers in the fields of biochemical engineering, antibiotics, mycology, and botany will find it a useful and necessary reference and a guide from the standpoint of methodology.

CHARLES N. FREY
Scarsdale, N. Y.

AN INTRODUCTION TO THE PRINCIPLES OF PLANT PHYSIOLOGY. Walter Stiles. 701 pages, with 5 plates and 58 diagrams; indexed. Pitman Publishing Corp., New York. (Printed in Great Britain.) Rev. ed. 1950. $12.50.

The author's preface to the first edition (1936) of this well-written textbook expressed his hope that it would be useful to university students "reading for pass or honours degrees." The slant of the second edition (1950), reviewed here, remains the same. Its twenty-five chapters and something over eleven hundred references to the literature present the classical approach to plant physiology. Subject matter ranges from the physiology of the plant cell through metabolism and the physiology of development, to irritability and movement. About twenty per cent of the references cited represent research reported from America. Recognizing that scientific research is world wide, these few over two hundred U. S. A. references may be a fair share; yet it is a little shocking that only one-third of these are of work published in the past twenty years. Certain challenging topics are omitted altogether, and others of chiefly historic interest are treated at some length.

Stiles' text is not for reference by the layman, but will perhaps be useful for collateral readings for American students at the college or university level. Its pictures are few, but it has one hundred twenty tables and nearly sixty graphs. At the ends of occasional chapters, a few books are cited for background reading.

GEORGE S. AVERY, JR., *Director*
Brooklyn Botanic Garden

PUFFBALLS AND THEIR ALLIES IN MICHIGAN. Alexander H. Smith. 131 pages, illustrated, indexed. University of Michigan Press, Ann Arbor. 1951. $3.

This clear and accurate treatment of the gasteromycetes of Michigan is usable not only in that state but equally throughout the northeastern quarter of the country and only slightly less so throughout the eastern two-thirds, both north and south. It includes a general discussion of the group and descriptions and keys to the species of puffballs, earth-stars, false truffles, and stinkhorns. The author advises caution, because of the possibility of individual sensitivity, when one first eats a new kind of puffball, but correctly reports that none is known to be generally poisonous. The half-tone illustrations are excellent and sufficient in themselves to permit identification of many species.

DONALD P. ROGERS

SOIL MICROBIOLOGY. Selman A. Waksman. 356 pages, illustrated, indexed. John Wiley & Sons, New York. (Printed in Great Britain.) 1952. $6.

SOIL MICROBIOLOGY, according to its author, is to be considered a "textbook" and as such accomplishes its purpose. It is not a book to be read casually for a broad picture of the biological aspects of the soil, nor is it sufficiently detailed to be a reference book on this subject. It does provide a springboard for the interested person to jump into the sea of facts and theories that has been accumulating in a rising tide of research.

After a brief historical background, the author discusses the microbiological population and its action on the components of soil. Following this review, decomposition of plant and animal residues, the formation of humus, the evolution of carbon dioxide, and the transformation of nitrogen both in nitrate formation and nitrate reduction, as well as nitrogen fixation by symbiotic and non-symbiotic organisms, are covered. Further chapters deal with mineral transformations and the interrelationship of higher plants and soil microorganisms, with their associative and antagonistic effects and their action as disease producers on both plants and animals. Two chapters treat the biological composition and action of stable manures, composts and green manures together with their relations to soil fertility.

The book concludes with a brief discussion of the recent developments in soil microbiology. Each subject is supplemented with a selected list of pertinent references.

JOSEPH C. GILMAN
Dept. of Botany & Plant Pathology
Iowa State College

SOILS AND SOIL FERTILITY. Louis M. Thompson. 339 pages, illustrated, indexed. McGraw-Hill, New York. 1952. $5.

The author states that the book has been prepared for students with little training in chemistry. Some knowledge of chemistry is highly desirable, however, in understanding even the rudiments of soil fertility. With this need in mind, one chapter is devoted to a brief introduction to basic chemistry.

This book, although not aimed at the home gardener, has many fundamental and practical items of value to home gardening. It is easy to read and the subject matter is developed lucidly and logically. Intricate details of interest only to the well-trained scientist are omitted. The book should serve as an excellent reference on soils.

Chapters are included on the physical properties of soils, soil moisture, biological properties of soils, chemical composition of soils, soil formation and classification, clay minerals, soil acidity and alkalinity, the principles and practice of liming, the role of nitrogen, phosphorus and potassium in soils and in plant growth, information on fertilizers and their use, the utilization of farm manure, the place of sulfur and the minor elements (boron, manganese, copper, zinc, molybdenum, iron) in soils and plants, variations in plant composition, crop rotations and soil fertility, and soil erosion and its control.

The book is excellently illustrated with numerous photographs, diagrams, and graphs. Tables are used for presenting detailed information. The book is well printed and practically devoid of errors. One criticism might be that examples of applications of soil science have been drawn predominately from midwestern agriculture. This limits somewhat the usefulness and adaptability of the book to other regions, especially since presumably it has been written for the more practical-minded reader.

C. L. W. SWANSON
Conn. Agr. Exp. Sta.

PATHOLOGY IN FOREST PRACTICE. Dow Vawter Baxter. 601 pages, illustrated, indexed. John Wiley & Sons, N. Y. 2nd edition, 1952. $7.50.

The author successfully extends forest pathology beyond purely academic limitations and outlines important economic achievements. In recent years the science has developed far past the frontier of tree fungi, whether cause or result in disease

(Continued on page 98)

NEWS, NOTES and COMMENTS

"Open House." The Volunteer Associates of The New York Botanical Garden announce "Open House" on the second Tuesday of each month, June through September excepted, from 3:00-5:30 p.m. in the Downtown Members' Room, 22 E. 60th St., New York City. One of the Garden staff will be present to answer questions. Dr. William J. Robbins, Director, was at "Open House" on March 10; Miss Elizabeth C. Hall, Librarian, on April 14; and T. H. Everett, Horticulturist, on May 12.

Advisory Council. Mrs. John W. Donaldson, Millbrook, N. Y.; Mrs. William Kemble, Bedford Hills, N. Y.; Mrs. John E. Lockwood, New York City, and Mrs. Thomas W. Stevenson, Mt. Kisco, N. Y., were elected members of the Advisory Council at the meeting of the Board of Managers on January 29, 1953.

"Cotton From Fables to Fashion" is the theme of the exhibition that will open in the Museum Building of The New York Botanical Garden on May 11 and will continue until November 15. The opening of the exhibition coincides with the first day of National Cotton Week, May 11-16.

From time before the written word down to American cotton textures of 1953, the exhibits will illustrate the history and development of the industry that has grown around one small genus of plants, *Gossypium*, or cotton plant.

The exhibition will be comprised of several sections, including botanical; primitive culture and uses; spinning and weaving, both ancient and modern; cotton fashions of various periods.

Six museums are cooperating with The New York Botanical Garden in the exhibition "Cotton From Fables to Fashion": American Museum of Natural History, Brooklyn Museum, Cooper Union, Marine Museum of Mystic, Conn., Metropolitan Museum of Art, and Museum of City of New York. The National Cotton Council is also lending its full support to the exhibition.

Lambertus C. Bobbink Memorial Trophy Awarded for First Time. A new trophy to perpetuate the memory of the late Lambertus C. Bobbink was offered for the first time in competition at the International Flower Show, New York City, March 1953. The trophy is awarded to the most outstanding horticultural exhibit in the show covering fifty or more square feet.

By happy circumstances, the special panel of judges selected the begonia exhibit of The New York Botanical Garden to receive this award. During Mr. Bobbink's lifetime, he was greatly interested in The New York Botanical Garden and especially its rose garden. Some years ago, a large bronze plaque was dedicated in the rose garden to Lambertus C. Bobbink in appreciation of the many thousands of rose plants donated by the firm of Bobbink & Atkins.

Herbarium Bequest. The herbarium which The New York Botanical Garden received by the bequest of Dr. S. C. Damon has been sorted, repacked, and distributed. It consists of about three hundred specimens, including thirteen types, and also a small collection of slides; notebooks and manuscripts resulting from Dr. Damon's work were also included. Since the *Dematiaceae*, with which Dr. Damon was chiefly concerned, are receiving attention these days because of their activity in fiber distribution, this is a very useful addition to the herbarium of The New York Botanical Garden.

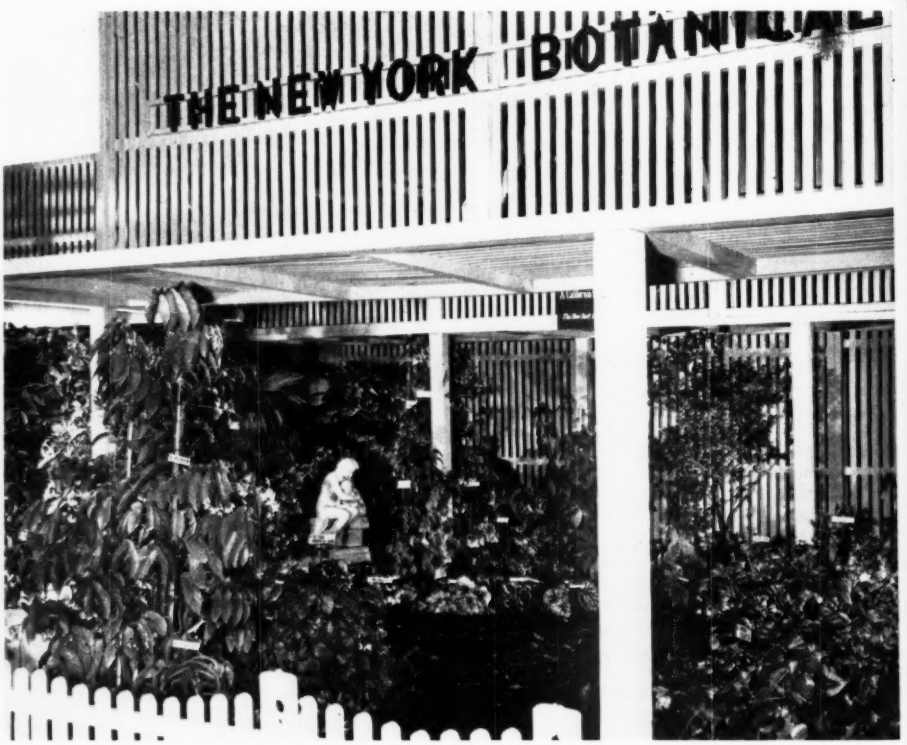
Witherbee Expedition. Word was received the end of March that Dr. Bassett Maguire, Curator of The New York Botanical Garden, had completed four weeks' exploration on the top of Yutaje, another fine mountain in Venezuela that yielded interesting plant material. In preparation for the climb up Yutaje, Dr. Maguire and his party stayed in San Juan, a tiny village established by Melisio Perez in the upper Manapiare, a tributary of the Ventuari, one of the main affluents of the upper Orinoco. Yutaje lies as an enormous blue serrania fifteen or twenty miles north of San Juan and is usually immersed in great banks of cumulus clouds. However, Dr. Maguire, as he stated in a letter to Dr. David D. Keck, Head Curator of The New York Botanical Garden, "caught a brief glimpse of most of the range through binoculars and picked out a summit which seemed accessible. Our camp, if we can make it there, will be at about 5,500 feet in a savanna near the brink of a spectacular waterfall which must be 1,500 feet high, sheer drop." His letter continued:

"Additional fresh foods and cassabe have been bought or arranged for, and the Indian crew of eight, in addition to our regular four boys, hired. The Indians have gone on in small curiares in which we shall have to make the last leg of the river trip. Tomorrow morning we leave with our large falca and motor for the last half day's run under power. We have set the date for our arrival back in San Juan as March 7. We hope to make it pretty close to that date.

"Unusual rains for the dry season have plagued us, but that will make it a little easier to get up the small streams. And, I hope, it will give us better collecting on the summit — although it will make living much more trying. On this part of our expedition only two collections have been made so far, both of the Podostomaceae, which I could put away in vials. Our real collecting will begin when we reach base camp, presumably three days off."

While Dr. Maguire was collecting on Yutaje, Dr. John Wurdack, Assistant Curator of The New York Botanical Garden, collected on the cumbre of Acopán several thousand specimens, representing three hundred sixty numbers. These included a full collection of tree ferns which run wild over the slope forests. Dr. Wurdack reached an altitude of 7,050 feet in the upper cumbre of Churi-tepui (Muru-tepui of maps, but incorrectly labeled) and also explored the equivalent of the lower cumbre of Sarven-tepui. On the side of the mountain toward the Rio Caruai, the two escarpments almost merge into one, and Dr. Wurdack noted a similarity in the flora to that of Arryan-tepui.

He rejoined Dr. Maguire at San Fernando de Atabapo and they are now exploring the Casiquiare, through which some waters from the Alto Orinoco escape to the Rio Negro and thence to the Amazon. They are expected to return from this expedition to the hinterland of Venezuela, about the headwaters of the Orinoco, some time in May.



The California Begonia Garden, exhibited by The New York Botanical Garden at the International Flower Show, March 8-14, 1953, received a gold medal certificate and the Lambertus C. Bobbink Memorial Trophy. The garden was designed and planned by T. H. Everett, Horticulturist; the plants grown by Louis Politi, Head Gardener, and his assistants.

Dr. William J. Robbins, Director of The New York Botanical Garden, accepts the Lambertus C. Bobbink trophy from Mrs. Bobbink. Witnessing the presentation are T. H. Everett, Horticulturist, Mrs. George C. White, daughter of Mrs. Bobbink and co-donor of the trophy, and James S. Kelly, Chairman of Judges of the International Flower Show.

Dr. Cronquist on Collecting Trip into the Pacific Northwest. Dr. Arthur Cronquist, Associate Curator of The New York Botanical Garden, left on March 28 for an extensive collecting trip into the Pacific Northwest. He intends to prepare sets of specimens of the flora from several hitherto poorly collected ranges surrounding the John Day Basin in central Oregon. Special objectives of the trip include studies of members of the sunflower family, for which Dr. Cronquist is preparing accounts for two regional floras, currently in preparation. This field work will be augmented by herbarium studies in several West Coast herbaria at the end of the field season. Dr. Cronquist will return from this expedition, made possible in part by a travel grant from the American Philosophical Society, in the late summer.

Dr. Cowan Abroad. On March 16, Dr. Richard S. Cowan, Assistant Curator of The New York Botanical Garden, gave a talk to the staff of the herbarium at the Royal Botanic Gardens at Kew, Surrey, England, on "Lost Worlds Found" — an account of his expedition to Venezuela with Dr. Barrett Maguire. Dr. Cowan also showed slides of the various seasons at The New York Botanical Garden, in which his audience was especially interested. Dr. Cowan has been studying in England since last September on a postdoctoral scholarship awarded by the National Science Foundation. He will leave England this spring to continue his studies on the continent and will sail from Genoa, Italy, on September 4.

200th Anniversary. In commemoration of the 200th anniversary of the publication of SPECIES PLANTARUM by Carl Linnaeus, a special program was televised on NBC network Easter Sunday afternoon, April 5. The program presented scenes from the botanist's life, with Kathi Norris as narrator. Dr. William J. Robbins, Director of The New York Botanical Garden, summarized Linnaeus' contributions to the field of botany, and also spoke of the many ways in which a botanical institution, such as The New York Botanical Garden, serves humanity.

Garden Club of America Awards. Margaret P. (Mrs. J. Willis) Slaughter, who contributed the article on "Growing Spuria Iris on the Gulf Coast" in the March-April issue of The Garden Journal, received the Eloise Paine Luquer Medal at the annual meeting of the Garden Club of America in New Orleans on March 24. She was selected by the Awards Committee for this honor for distinguished contributions in the field of botany. The Frances K. Hutchinson Medal for distinguished contributions in the field of conservation was awarded to Mrs. Luis J. Francke of the North Country Garden Club of Long Island; the Margaret Douglas Medal for contribution to conservation-education to Mrs. Robert C. Wright of the Gardeners of Philadelphia; the Amy Angell Collier Montague Medal for "Civic Achievement" to Mrs. Norman Livermore of Ross, Cal. Edwin De T. Bechtel of New York City received the Jane Righter Rose Medal for his "practical and scholarly contribution in the field of rose culture."

Precedent was broken in presenting the sixth award, the Achievement Medal, to a member club rather than an individual member. The Garden Club of Cleveland is the first organization to be honored with this award since it was created in 1932 — and its achievement is the establishment of the Garden Center of Greater Cleveland.

The Founder's Fund Award was presented to the South Country Garden Club of Rhode Island for the purpose of restoring a colonial garden at Smith's Castle, in historic Cocumscussoc, Wickford, R. I.

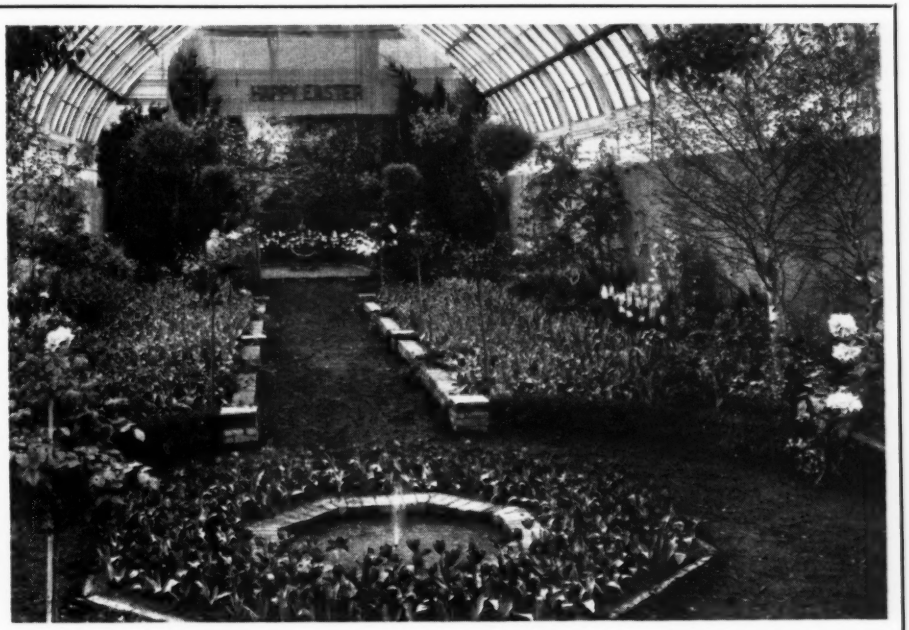
New Botanical and Cultural Center. A new botanical and cultural center will be developed at Mansfield, Ohio. Under the terms of the trust created by the late Charles K. King, Kingwood Center will provide a "program for educational, community, and recreational activities with special emphasis on the advancement of science through the collection and culture of plants, trees and shrubs; the advancement of botanical science and knowledge and the prosecution of original research therein and in kindred subjects."

Dr. Raymond C. Allen of Harrisburg, Pa., has resigned as Executive Secretary and Editor of the American Rose Society,

Fifteen thousand potted plants and bulbs, the largest number ever used in any one show in the Conservatory of The New York Botanical Garden, were combined into a colossal "Pageant of Spring." T. H. Everett, Horticulturist, designed and planned the Easter Show; Louis Politi, Head Gardener, and his assistants, grew the plant material.

Eight thousand tulips and two thousand daffodils, presented by the Associated Bulb Growers of Holland to The New York Botanical Garden last fall were featured prominently in this floral display. There were also one thousand lilies, five hundred primroses, five hundred pelargoniums, three hundred hydrangeas, and standard roses, azaleas, camellias, freesias, calceolarias, cinerarias, calla lilies, and iris "Wedgewood."

The renovation of two houses of the Conservatory was completed in time to stage the Easter Show. These houses have been redesigned especially to provide adequate areas for such exhibits.



and accepted the appointment of Director of Kingwood Center. A native of Barre, Massachusetts, Dr. Allen was graduated from the University of Massachusetts and received his Ph.D. from Cornell. He served on Cornell's faculty for ten years and was also associated with Boyce Thompson Institute for Plant Research.

Dr. Paul J. Anderson Retires. Dr. Paul J. Anderson, who headed tobacco research work in Connecticut for more than a quarter of a century, retired on April 1 as chief of the Tobacco Laboratory of the Connecticut Agricultural Experiment Station. Strains of shade tobacco originated by Dr. Anderson and his colleagues now comprise more than ninety percent of the acreage grown in Connecticut and Massachusetts. The list of Dr. Anderson's contributions to the control of tobacco disease is long; he was the originator of the fermate spray method of controlling blue mold of tobacco. He has published about seventy-five bulletins, circulars, and scientific papers on tobacco.

Emile Mardfin Appointed Executive Secretary, American Institute of Park Executives. Emile Mardfin assumed his post as Executive Secretary of the American Institute of Park Executives on March 1. Mr. Mardfin retired from the New York City Park Department, in which he was Assistant Director of Maintenance and Operation. He was responsible for the establishment of the City's extensive experimental work on soil improvement, special grasses, irrigation and park design. Prior to his service with the Park Department, Mr. Mardfin managed Bronxville Nurseries.

AMONG OUR CONTRIBUTORS

(Continued from inside cover page)

1920's, is Lecturing Professor of Botany, Harpur College, the State University of New York, at Endicott, and Research Associate in Ornamental Horticulture, Cornell University. Dr. Bowers also conducts a private plant breeding laboratory in his home town, Maine, N. Y. He has been especially interested in rhododendrons and azaleas and is author of RHODODENDRONS AND AZALEAS. . . . H. F. LOOMIS is Senior Agronomist, Bureau of Plant Industry, Soils and Agricultural Engineering, U.S.D.A., in charge of the U. S. Plant Introduction Garden at Coconut Grove, Fla. Mr. Loomis has traveled extensively on scientific expeditions to China, Costa Rica, British and Dutch Guianas, British Honduras, Guatemala, Haiti, Nicaragua, Panama, Trinidad. . . . JOSEPH MONACHINO is Associate Custodian of the Herbarium of The New York Botanical Garden. . . . MARGARET ILGENFRITZ, a native New Yorker, moved to Michigan upon her marriage some twenty years ago. For the past fifteen years she has been engaged with her husband in their nursery firm. Mrs. Ilgenfritz took up orchid growing as a hobby eight years ago; each year she imports many species from various countries. Her collection also includes many "strictly greenhouse-grown cattleyas and allied hybrids." . . . ELIZABETH A. PULLAR, garden consultant with resident offices in New York City and Thomaston, Conn., also conducts classes in nature study at a private school. She is also helping a group of 4-H children in Litchfield County, Conn., to develop interest in nature. . . . ROMAINE F. BUTTON is assigned to the Nature Study Office of the Board of Education of the City of New York, and is editor of "Nature Garden Guide." . . . GERTRUDE B. FOSTER is editor of "Herb Grower Magazine."

BOOK REVIEWS **(from page 95)**

complex, and this volume takes full advantage of the opportunity to organize current research for the comprehensive practice. Increasing application of sound principles outlined will hasten the welcome day of real conservation of essential resources in trees, forests, and forest products.

Without losing sight of the importance of disease fungi, the reader is made fully aware of the true value of site and the successive, and sometimes intricate, developments involved therewith. In ten well-organized chapters and a helpful index the student, plant pathologist, industrialist, and teacher will find accurate and dependable information, thoughtfully assembled on a sound basis for forest disease prevention and control.

As evidence of the expanding economic importance of diseases of shade and ornamental trees, it is interesting to note that this special field of forest pathology has been accorded one hundred pages of discussion with a valuable list of one hundred seventeen appropriate references. Especially destructive diseases which are now widespread, as the Dutch elm disease, elm phloem necrosis, and oak wilt, are described in careful detail, while sprays for the control of certain pests are suggested. Of genuine interest to the layman are several classified lists of trees: pest-resistant, tolerant of drought, cold, etc.

The complete text is well illustrated, although in some instances the inclusion of a suitable scale in illustrations or added word in legends would aid the novice pathologist immeasurably.

MALCOLM A. MCKENZIE, *Director*
Shade Tree Laboratories
University of Massachusetts

GUIDE TO ENGLISH GARDENS. Alice Chauncey. 28 pages, illustrated. The Horticultural Society of New York, Inc. 1952. $1.

The "Guide" offers practical advice to the visitor abroad from Miss Chauncey's intimate knowledge of England and Scotland's notable homes and gardens. Suggestions include fifty private gardens that are open to visitors and a calendar summary of the countryside flowering attractions.

HERBS USED IN UKRAINIAN FOLK MEDICINE. Natalie Ossadcha-Janata. Research Program on the U.S.S.R., and The New York Botanical Garden. 114 pages, indexed. New York. 1952. $1.25.

This is the English translation of an abbreviated draft of a dissertation manuscipt, based on the author's studies during the years 1927-43 when she led a number of official expeditions into all corners of the Ukrain to ferret out original information on the uses of medicinal plants by the folk. The chemical composition of herbs is as yet little known, and it is the hope of the author that this paper will enlist "the interest of the appropriate circles in the United States toward the search for new medicines by investigating the local flora and linking up the results with those obtained in other countries."

THE PORTABLE GARDEN. A Sunset Book. 64 pages, illustrated, indexed. Lane Publishing Company, Menlo Park, Calif. 1952. $1.

With concise text, numerous illustrations, drawings, and charts, this "Sunset Book" gives good advice on how to maintain a long season of color and blooms by rotating bulbs, annuals, perennials, and shrubs in pots and other containers. The advice will be especially appreciated by patio and penthouse gardeners.

RECENT ACQUISITIONS TO THE LIBRARY

American Tomato Yearbook. Westfield, N. J., C. S. MacFarland, Jr. 1951. $2.00.

Arnberger, Leslie P. Flowers of the Southwest Mountains. Ann Arbor, Cushing-Malloy, Inc., 1952. $1.00.

Bisset, K. A. The Cytology and Life-History of Bacteria. Baltimore, Md., Williams & Wilkins, 1950. $3.50.

Castetter, Edward F., and Willis H. Bell. Yuman Indian Agriculture. Albuquerque, University of New Mexico Press, 1951. $6.00.

Clapham, A. R., T. G. Tutin and E. F. Warburg. Flora of the British Isles, N. Y., Cambridge University Press, 1952. $9.50.

Douglas, J. Sholto. Hydroponics, the Bengal System. London, Oxford University Press, 1951. $2.00.

Evans, E. A., Jr., Biochemical Studies of Bacterial Viruses. Chicago, University of Chicago Press, 1952. $2.75.

Goldsmith, Margaret O. Picture Primer of Dooryard Gardening. Boston, Mass., Houghton Mifflin, 1952. $2.00.

Hardin, Garrett. Biology; Its Human Implications. San Francisco, Freeman, 1952. $5.00.

Hayes, Naida Gilmore. Old Wood in New Ways. Berkeley, Calif. 1952. $1.00.

Hitchcock, C. Leo. A Revision of the North American Species of Lathyrus. Seattle, University of Washington Press, 1952. $2.50.

Janes, E. R. The Flower Garden. Baltimore, Md., Penguin Books, 1952. 85¢.

Leeper, G. W. Introduction to Soil Science. 2d. ed. rev. New York, Cambridge University Press, 1952. $5.00.

Lent, Henry B. From Trees to Paper. New York, Macmillan, 1952. $2.75.

Li, Hui-Lin. Floristic Relationships between Eastern Asia and Eastern North America. Philadelphia, American Philosophical Society, 1952. (Trans. Amer. Phil. Soc., n.s. 42 (2), Aug. 1952.) $1.00.

Linssen, E. F., comp. Nature Interlude, a Book of Natural History Quotations. London, Williams & Norgate, 1951. 12/6.

Lyon, T., Lyttleton, Harry O. Buckman, Nyle C. Brady. The Nature and Properties of Soils. 5th ed. New York, Macmillan, 1952. $5.75.

Mango Studies. Stuart, Fla., Stuart Daily News, 1951. $4.00.

Nash, Leonard K. Plants and the Atmosphere. Cambridge, Mass., 1952. (Harvard Case Histories in Experimental Science, No. 5.)

Nord, F. F., ed. Advances in Enzymology and Related Subjects. New York, Interscience, 1952. Vol. 13. $18.00.

Peattie, Donald Culross. Sportsman's Country. Boston, Houghton Mifflin, 1952. $3.00.

Prianishnikov, Dmitrii N. Nitrogen in the Life of Plants. Madison, Wisconsin. Kramer Business Service, 1951 (mimeographed).

Srb, Adrian M., and Ray D. Owen. General Genetics. San Francisco, Freeman, 1952. $5.50.

Stiles, Walter and William Leach. Respiration in Plants. New York, Wiley, 1952. 3d. ed. rev. $2.25.
Strausbaugh, Perry D., and Bernal R. Weimer. General Biology. New York, Wiley, 1952. 3d. ed. $6.00.
Taylor, Raymond L. Plants of Colonial Days. Williamsburg, 1952. $1.25.
Thimann, Kenneth V., ed. The Action of Hormones in Plants and Invertebrates. New York, Academic Press, 1952. $5.80.
Tiffany, Lewis Hanford, and Max Edwin Britton. The Algae of Illinois. Chicago, University of Chicago Press, 1952. $10.00.
Truog, Emil, ed. Mineral Nutrition of Plants. Madison, University of Wisconsin Press, 1951. $6.00.
Welch, Paul S. Limnology; 2d. ed. New York, McGraw-Hill, 1952. $8.00.
Westveld, R. H., and Ralph H. Peck. Forestry in Farm Management. 2d. ed. New York, Wiley, 1951. $5.00.
Wolfe, John N.; Adolph Waller; S. S. Humphrey; Clara Weishaupt. Guide to Ohio Plants. Columbus, Ohio, Long's College Book Co., 1952. (Loose leaf, spiral binding.) $2.75.

Correction. J. A. Schuurman bears the title of Minister Plenipotentiary in the Department of Foreign Affairs of the Republic of Indonesia and is not High Commissioner as was erroneously stated in the January-February issue of The Garden Journal.

The Forest Preserve Controversy. "Among the occupational hazards of authorship are the things that can happen to the author's brain child after it leaves his desk. This is inevitable, because it takes so many people besides the author himself to get an article into print.

"In the case of 'The Forest Preserve Controversy,' which appeared in the March-April issue of 'The Garden Journal,' something went wrong in our drafting room at Albany, with the result that the map of the Adirondack Park showed up with an error of first magnitude in the legend appearing in the lower right-hand corner. Here, the phrase: 'Forest Preserve boundary' line was used to designate the heavy line surrounding the aggregations of State land. Of course, 'Forest Preserve boundary' is exactly what the heavy line is *not* — and discerning readers who compared the text with the illustration must have sensed this at once. This famous line marks the boundary of the 'Adirondack Park,' which has nothing in the least to do with the actual limits of the State-owned lands constituting the Forest Preserve. The moral of this incident is, no doubt, that education begins at home and that we had better give our own staff a better briefing on some of these technical distinctions.

"As if the above weren't enough, it appears that we submitted *two* cuts for the map — a positive and a negative. Not being aware of this, your author prepared a caption for the *positive*, whereas the layout man picked the *negative* for reproduction. So, if you will look at the map again, you will see that the State lands are in *white* instead of *black*.

"As I told your good editor, perhaps mistakes of this kind serve a purpose in letting us find out how many people read our pieces critically. (I understand that several have already written in, calling attention to the errors, and to me this is a most gratifying result.) If our own bungling has in any way served to point up what we were attempting to explain and to stimulate interest in the exceedingly complex relationships of Adirondack land-holdings, we will glady 'take the bitter with the sweet'."

E. W. Littlefield

Anent St. Dabeoc. "I had become interested in finding out something about the Saint (for I *did* find out that he *was* a Saint!) who had lent his name to the genus *Daboecia,* the Irish heath.

"None of the books to which I had ready access gave any information about him at all. Finally I obtained the accompanying memorandum from Fordham University Library, which represents the research by Joseph P. Hart, Head Librarian, on my inquiry.

"It seems to me the material is sufficiently little known to be worth while giving it space in The Garden Journal, and if you think well of it, Mr. Hart has kindly given his consent to its being so used."

Clarence McK. Lewis
New York, N. Y.

Daboecia (after its Irish name, St. Dabeoc's heath). More commonly spelled *Daboccia,* and sometimes *Dabeocia.* Syn., *Boretta.* Ericaceae. Shrubs cultivated for its purple flowers appearing in summer.

Low evergreen with alternate entire leaves and drooping pedicelled flowers in long terminal racemes: corolla ovoid, contracted at the mouth and shortly 4-lobed, with recurved lobes; stamens 8, included: caps. 4-celled, dehiscent. One species in West Europe.

This is a very pretty heath-like plant, with purple or white flowers in elegant loose racemes, well adapted for rockeries or borders of evergreen shrubberies. Requires protection North during the winter, and thrives best in a peaty, sandy soil. Propagated by seeds treated like those of *Erica,* and by cuttings of half-ripened wood under glass.

Bailey, L. H. Standard Cyclopedia of Horticulture (New York 1935), 1:950.

Dabeoc (Dabheog, Dabheoc, Beoc, Beog, Mobeoc, Mobheoc, Mobheog, Beanus).

Saint and Abbot, fifth or sixth century, feast celebrated on January 1, July 25, and December 16, approved Cult. (not in Roman martyrology).

Abbot at Lough Derg (Glenn Geirg), Templecarn Parish, Donegal, Ireland.

Youngest of ten sons, seven or eight holy sisters (Blessed Gladusa, Melaria (mother of St. David, Abp. of Menevia), St. Keyne, St. Almeda, St. Nennoca, St. Carennia). One story has it that there were twenty-four daughters in the family and all blessed.

Son of Brecan or Braccan, who ruled over a territory in Wales (Brecknockshire), and of Digna (Dina or Din), daughter to a Saxon King and mother of many other saints.

Grandparents Bracha, an Irish-born prince (reputed to be grandson of Caelbadh, King of Ireland, d. 357) and Marcella, a noble British lady.

One other version of his lineage is that it stemmed from an Irish family in Ulster. At any rate, he was of Cambro British stock, Irish-Saxon-Cyrmic blood.

Cambro-British wars likely reason for seeking a peaceful refuge in Ireland and settled in Donegal.

Lough Derg contains three islands, including the Island of St. Dabeoc, which is the largest, and St. Patrick's Purgatory; also located there was the Monastery of St. Augustine, the origin of which is attributed to St. Dabeoc.

He flourished about St. Patrick's time or shortly thereafter. His austere life led to frequent pilgrimages to the Island by others for penitential exercises in later times.

His reputation for foretelling many things rests on his prediction regarding St. Columba. Late one night when a wondrous light appeared on the north horizon, he forecast by name the sanctity and power of St. Columba many years before this saint's birth.

Sources

O'Hanlon, John — Lives of the Irish Saints, 1:11-16.
Holweck, F. G. — Biographical Dictionary of the Saints (1924), 151.
Book of Saints — 4th Edition (1947). 100.

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U.S.D.A. Publications for Gardeners. Gardeners who have turned to the Department of Agriculture for help will know something about the excellent material published by the Department. However, unless they have had occasion to ask quite a number of questions, even gardeners may not know the diversity of subjects represented by Agriculture's "documents." Various agencies of the Department issue technical and statistical data, covering everything from current crop estimates to measurements of stress in laminated wood. But they also publish a wealth of popular material. Some of this is broad in scope, like the "Yearbooks of Agriculture"; much of it is specific, like the "Farmer's Bulletins" which usually deal with a single subject. All of it is of interest.

Take the "Yearbooks of Agriculture," for example. Since 1948, four have been published. Of these, gardeners will want to have these three:

Grass (1948). 892 p. $2.00. Order No. A 1.10: 948G.
Trees (1949). 944 p. $2.00. Order No. A 1.10: 949G.
Insects (1952). 780 p. $2.50. Order No. A 1.10: 952G.

The "Yearbooks," a series of essays by experts, cover every aspect of their subjects. The first two above discuss the botany, cultivation, and care of grasses and trees, useful and ornamental. The third discusses friendly and unfriendly insects, pests on ornamental shrubs, flowers and trees, and methods of control.

The Department of Agriculture has a number of pamphlets dealing with garden care, methods of planting, culture of specific plants, transplanting, and so on:

Growing vegetables in town and city. 1951. 40 p. 20¢. Order No. A 1.77:7G.
Suburban and farm vegetable gardens. 1951. 46 p. 25¢. Order No. A 1.77:9G.
Growing annual flowering plants. 1950. 26 p. 15¢. Order No. A 1.9:1171G.
Herbaceous perennials. 1929. 84 p. 25¢. Order No. A 1.9:1381G.
House plants. 1941. 30 p. 10¢. Order No. A 1.9: 1872G.
Growing fruit for home use. 1939. 54 p. 20¢.
Dwarf fruits. 1939. 8 p. 5¢. Order No. A 1.35: 178G.
Savory herbs: culture and use. 1946. 33 p. 15¢. Order No. A 1.9:1977G.

If a gardener wants to do his own landscaping, and perhaps even his own building (within reasonable limits), he will want to see the following booklets, of which the first was issued by the Education Office:

Landscaping the farmstead. 1938. 88 p. 30¢. Order No. I 16.54/3:189G.
Greenhouse construction and heating. 1952. 38 p. 15¢. Order No. A 1.9:1318G.
Hotbeds and coldframes. 1941. 28 p. 10¢. Order No. A 1.9:1743G.
Sash greenhouses. 1946. 8 p. 5¢. Order No. A 1.35:124G.

Insects and other pests of crops, flowers, shrubs, and trees have received devoted attention from government researchers. The books and pamphlets noted next deal with the identification and eradication of unwelcome visitors, of whatever kingdom:

Poison-ivy, poison-oak, and poison sumac: identification, precautions, eradication. 1951. 30 p. 10¢. Order No. A 1.9:1972G.
Handbook on insect enemies of flowers and shrubs. 1948. 115 p. 45¢. Order No. A 1.38: 626G.
Vegetable gardener's handbook on insects and diseases. 1953. 30 p. 20¢. Order No. A 1.77: 23G.
Insect enemies of eastern forests. 1950. 679 p. $2.50. Order No. A 1.38:657G.
Insect enemies of western forests. 1952. 280 p. $1.00. Order No. A 1.38:273/3G.

In both of the last two titles above, ornamental and shade trees are discussed; however, it should be noted that both books are primarily about *insects*.

Gardeners sufficiently ambitious to prepare the fruits of their own activities will want these booklets, which are packed with practical advice and hints, almost guaranteeing perfect results:

Family fare: food management and recipes. 1950. 96 p. 25¢. Order No. A 1.77:1G.
Home canning of fruits and vegetables. 1951. 24 p. 5¢. Order No. A 1.77:8G.
Home freezing of fruits and vegetables. 1951. 48 p. 15¢. Order No. A 1.77:10G.
Home-made jellies, jams, and preserves. 1945. 18 p. 10¢. Order No. A 1.9:1800G.

All of the titles mentioned in this article are to be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C. They may be ordered as noted here; *the order number must be included.* Titles listed are abbreviated in some instances, and author, series entry, and issuing agency are not given.

W. Philip Leidy

The author of the above article has made government "documents" a hobby for a number of years — which sounds like a pretty dry business, but is, in fact, far from it. For what Mr. Leidy collects is "popular" documents — those dealing with practical, everyday problems, with history, business, and handicrafts. Various agencies of our government publish an astonishing amount of material on all of these subjects, and at very low cost.

There are excellent books and pamphlets on child care, on gardening of all types, on home economics, including the cooking and preservation of foods, on house construction, on livestock and poultry raising, on sewing and dressmaking. There are several fine series on our national parks and forests, on our historic sites. There are beautiful booklets on wildlife and camping — excellent things for child and adult alike. There are tense and authoritative histories of our part in the two World Wars, told by army and navy historians. There are scores of charming booklets on Latin and South America.

Some twenty-five hundred of the best of these have been brought together into Mr. Leidy's "Popular Guide to Government Publications," a select and annotated list now available from the Columbia University Press, New York, at $3.00. It is the only index of its kind and scope ever attempted.

from the HERB SHELF

"Eat leeks in Lide (March) and
ramsons in May,
Then all the year after physicians
may play."

Although you may think that the advice of the old proverb above was heeded only in Chaucer's time, nevertheless it is a fact that in parts of our southern mountain section, where remnants of old English speech remain unchanged, ramsons or "ramps" are still eaten. The gathering of the wild garlic, *Allium ursinum,* is attended by all the mystery and masculine joviality of a masonic smoker. The men protest that they are only going bear hunting! The plant is also called "bear's garlic," where it grows abundantly on the moist, meadow banks of the Great Smoky region. The perennial lance-like leaves smell strongly of onions when crushed. Ramsons is plural of "ramse" or "ram," meaning rank. The colloquial "buck rams" or "buck rampe" refers to its spadix. The leaves are cooked and chopped fine to be served like spinach or used as a green sauce for meat and fish.

The need for something green to offset a winter diet of fresh or dried meat must have compelled primitive man to sample in spring the first green shoots of every plant growing nearby. The regional tastes for such difficult-to-approach plants as thistles and nettles can be accounted for in the skill with which they are cooked and served with vinegar, lemon, or sharp-savored sorrel. Only the tender young tops of nettle are eaten. The bitter and prickly quality is lost in cooking, particularly if the first water is thrown away. Nettles possess valuable anti-scorbutic properties. Nettle beer was made in olden times as a healthful tonic.

This plant carries its own tiny hypodermic hairs which inject an acrid secretion into the bared flesh that brushes it. Fortunately for the gardener, burdock usually flourishes in the same soil which spawns nettle. A leaf of the dock rubbed on the rash will take out the nettle sting in a matter of seconds. Makers of special bacteria, which speed up the decomposition of weeds into compost, credit nettle with special action in the fermentation process.

Besides the many substitutes for spinach which may be gathered in fields and along roadsides by the epicurean botanist, there are some which pinch hit for the great spring delicacy, asparagus. The curiously-curled fronds of cinnamon and ostrich fern are gathered, as they first unwind, and are plunged in boiling water, to be cooked and buttered like asparagus. Milkweed shoots, poke-weed stalks, and peeled stems of burdock are used similarly. There is little danger of mistaking these plants for something poisonous, particularly if they are gathered when very young and freed from all traces of roots. However, it would be a good idea to have a copy of Dr. Walter Conrad Muenscher's new and revised edition of Poisonous Plants of the United States in the kitchen when cooking up such "country messes."

Gardening for Good Eating, by Helen M. Fox, whose new book The Years in My Herb Garden has just come out, gives recipes for cooking greens of an unusual nature. Many of the plants which we consider weeds were once cultivated for culinary purposes and various other uses to which the fibers were put, such as the making of thread and cloth.

Perhaps one of the best ways to rid your garden of unwelcome seedlings of lamb's quarters, dandelions, dock, plantain, and sheep's sorrel is to serve a few dishes of these wild greens to the family during the spring.

Greens to Be Mixed Together

Mustard	Chicory
Wild Onion	Curly Dock
Plantain	Peppergrass
Horseradish	Watercress
Sheep's Sorrel	Purslane

A mixture of wild greens is more tasty than any one particular variety cooked alone. Pick them when small, wash thoroughly in cold water, and plunge into boiling salted water for five minutes. Remove and put them into meat stock of boiled salt pork or bacon. Cook the greens until tender, then mince fine and serve with butter generously poured over them.

Gertrude B. Foster

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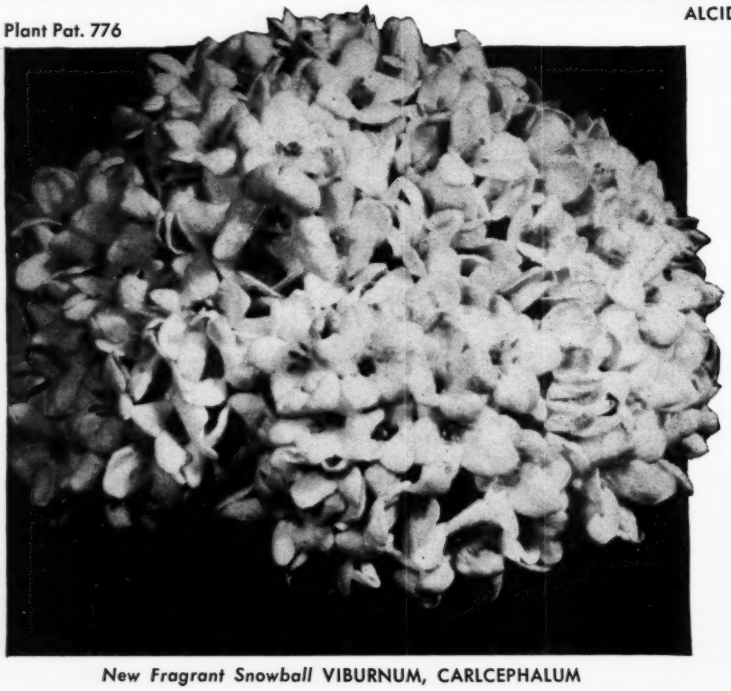

New Fragrant Snowball **VIBURNUM, CARLCEPHALUM**

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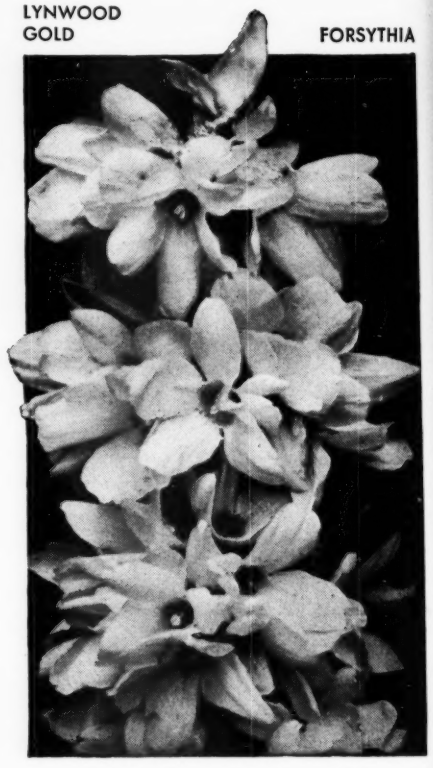
LYNWOOD GOLD FORSYTHIA



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